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# Journal

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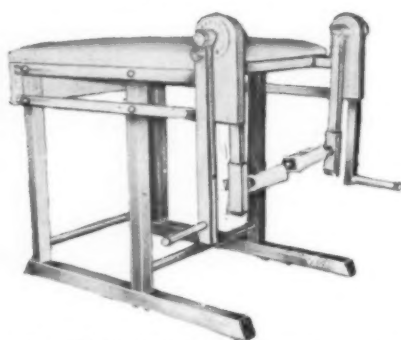


SEPTEMBER-OCTOBER, 1961

VOL. 15, NO. 5

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SEPTEMBER—OCTOBER, 1961

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# RESEARCH WITH IMPLICATIONS FOR THERAPEUTICS AND CORRECTIVE EXERCISE\*

H. HARRISON CLARKE, Ph.D.\*\*

When inviting me to speak on this occasion, your program chairman requested that I discuss the importance and implications of research for therapeutics and corrective exercise and to suggest ways by which the quality of research may be improved and its quantity may be increased in this field. Certainly, the purpose your chairman had in mind is a desirable one. It is obvious today that society respects science and readily accepts its findings. To be in tune with science is essential for any profession.

## *Importance*

Our life is permeated, saturated, and may even be surfeited with research. At Hiroshima, the atomic age was blasted into existence. Now, we have an atom-powered submarine that has crossed the top of the world. We have sputniks, guided aircraft and missiles, and a space satellite is in prospect. The Russians have shot the moon, and we intend to land an astronaut on it. In a recent volume of the American Heritage series, America's pioneering spirit was brilliantly portrayed from Christopher Columbus, the explorer of the earth, to George Ellery Hale, the explorer of the sun. On the closing page, this sentence appears: "The uttermost horizon of the pioneer is the limitless universe of space that reaches out around the speck of cosmic dust called Earth."

In a recent issue of *Life* (3) the effect research has had upon our society was dramatically presented. The article demonstrated vividly that the present lives and future fortunes of every American man, woman, and child are immediately influenced by the gigantic technical strides of the past few years. Any important scientific or engineering advance sets off a chain reaction. "It creates conflicts and hazards. It organizes the economy and disorganizes it. It provides social benefits and poses moral problems. This has been true since history began." In earlier days, such advances were few and far between, so that change was so gradual that man was hardly aware of

it. With the Industrial Revolution, however, the pace was accelerated. "And in the years since World War II, the change has come with an overwhelming rush. Today the progress of 100,000 Stone Age years is surpassed in a single year and the great accomplishments of the last century are eclipsed by those of the last decade."

## *Need*

The basic justification for research in therapeutics and corrective exercise must be found in improved services to children and patients. The use of exercise should be established on a scientific basis and not left to the opinions or whims of the corrective educator or the therapeutic technician. Those working closely with medical doctors; as is true for most members of the Association for Physical and Mental Rehabilitation, may logically expect a sympathetic response to the need for research in this field. Routinely, these doctors depend on current research in their practices; in fact, any doctor who ignored or was unaware of essential research in his branch of medicine might well be guilty of malpractice.

Research is essential if any field is to develop as a science; there is no other way. Writing on the healer and the scientist, Atchley (2) stated the case thus: "The art of healing is as old as recorded history; the science of healing is relatively young and only late stands on its feet. Medicine as a whole came of age when the stature of the science grew large enough for it to combine with the art in mutual understanding and respect."

At the start, and, perhaps for a long time, the fruits of research may seem disappointing and frustratingly inconclusive. This is not the fault of any one field or of the investigators in that field but is inherent in the nature of research. Typically and universally, the initial results of research have been crude. To prove it, think back in your mind's eye to the first airplane, the first automobile, the first sailing ship or locomotive, the first gun, the first radio; and contrast these with today's examples of the same.

The description of an early form of aseptic surgery in *The Doctors Mayo* by Clapsattle is amusing today, but illustrates the concept of early crudity of research: The walls of the room were lined with

\*Presented at the Joint Session of the Therapeutic Section and the Association for Physical and Mental Rehabilitation, annual convention of the American Association for Health, Physical Education, and Recreation, Atlantic City, N. J., March 20, 1961.

\*\*Research Professor of Physical Education, University of Oregon.

jars full of many kinds of antiseptic solution, each a different color. Operating tables were covered with rubber and flanked all around with drain pans to catch pailfulls of boiled water that were sloshed generously over everything in sight. The surgical staff wore rubber boots. And, again, an early form of Listerism: Instruments and sponges were soaked in antiseptic solution; dressings, sutures, and ligatures were carbolized; the operating table was scrubbed. Steam atomizers were started, some from wall brackets and others in the hands of assistants were trained directly into the field of operation.

So, be not discouraged. A good start has been made in research pertaining to therapeutics and corrective exercise; however, much more needs to be done.

### *What To Do*

Workers in the entire field of therapeutics and corrective exercise can be mobilized to contribute as research consumers and/or as research producers. Both of these functions, of course, are basic to progress toward scientific status. The following suggestions are made to achieve this end.

1. *Adopt a scientific approach to your job.* The properly trained person in therapeutics and corrective exercise has some background in the sciences undergirding this field, especially biology, physiology, physiology of exercise, anatomy, kinesiology, and psychology, and perhaps in chemistry and physics. This is a good foundation for research training. However, it is not enough, as the worker should keep up to date with the current research in his field.

It must be admitted that the job of keeping abreast of research is a most difficult one. Reports of studies related to therapeutics are widely scattered in the literature of such fields as anatomy, physiology, medicine, psychology, growth and development, nutrition, and the like. However, regular reading of the journals most closely related to each individual's work should be possible. The publication of review articles is very desirable, as these synthesize the research on particular subjects from many sources. Encouragingly, articles of this sort have recently appeared in the *Journal of the Association for Physical and Mental Rehabilitation*, by such authors as William R. Pierson, Philip J. Rasch, and David H. Clarke.

The application of this suggestion will not produce competent researches, as some special training is needed for this purpose. However, it will provide a foundation for such training; and, of great importance, it should produce a scientifically-oriented

professional group with a zeal for applying the products of research as a routine practice.

2. *Secure research training.* The person who aspires to be a research producer, in addition to being a research consumer, needs special training for this purpose. Such training, of course, can be initiated through formal courses. In addition to such basic sciences mentioned above, courses in tests and measurements, research methods, elementary and advanced statistics, and experimental design are desirable; additional studies in anatomy, physiology, and psychology are needed. Also recommended are courses in chemistry and physics. Finally, some experience in the conduct of actual research studies under competent guidance should put the new scientist in this field well on his way.

It should be said, too, that considerable research preparation and experience may be obtained through on-the-job training in some situations. This will be particularly true where the corrective therapist works directly with physiatrists or psychiatrists, who are themselves competent and experienced in research.

3. *Use measurement constantly on the job.* It has been my observation over many years in army and veterans hospitals, in rehabilitation centers, and in schools and colleges that corrective therapists and corrective physical educators make limited, if any, use of objective measurement. Not only is measurement essential for a good job, in order to determine patient status and to be able to follow his progress, but it is indispensable for research. Science universally employs measurement; until we can measure a factor, it cannot be objectively investigated. And, there are a good many tests related to therapeutics and corrective exercise which can be applied by non-medical personnel.

An essential starting point for any field to gain status as a science is to strive constantly for objectivity in measurement. It is true that much still cannot be measured; and the attempt to devise new testing instruments and to improve old ones should be a continuing process. We must also consider the total individual as well as his defect or disability. However, these considerations notwithstanding, valid tests should be used where available and when appropriate. Competency in testing techniques should not be assumed but should be acquired as a matter of course.

4. *Conduct research studies.* Today, very few individuals in physical education or corrective therapy imbued with the desire to concentrate on research as a major effort have the opportunity to do so. Invariably, they must include research efforts on a

part-time basis or as an extra-duty interest. Some suggestions for conducting research studies under present circumstances may be made.

Studies can be undertaken on an on-the-job basis. For the corrective therapist or the corrective physical educator who has become competent in measurement, inclusion of an adequate experimental design may well result in a succession of worthwhile investigations into his daily work. Quite possibly, collaboration studies with doctors, psychologists or psychiatrists, and others may be carried out. A review of various issues of the *Journal of the Association for Physical and Mental Rehabilitation* show that physicians and corrective therapists are jointly publishing articles. This is an indication of the type of research collaboration suggested here.

Extensive research laboratories and elaborate testing equipment, while helpful and permitting a greater range of studies, are not essential for good research. Ability to measure any human system (such as the strength of muscles, the range of joint movements, contractile fatigue, and many others) permit scientific investigations. For example, extensive studies have been devised and conducted around the Leighton flexometer, the tensiometer, the Kelso-Hellebrandt ergograph, and the like. Even a tape measure has potentialities. Ingenuity in the construction of "home-made" testing instruments is entirely possible; outstanding examples of such ingenious investigators are Peter V. Karpovich at Springfield College and Franklin M. Henry at the University of California.

There is considerable advantage in a concentration of research interest. A series of closely related and integrated studies, which systematically explore a specific, even if limited, area of a larger field, may result over a period of time in a significant and far-reaching contribution to knowledge. The work that

Karl K. Klein is doing in studies of the knee at the University of Texas is a good illustration of what is meant here.

As a matter of course, the investigator must constantly strive for objectivity in research. This applies not only to testing techniques but involves the whole thought processes relative to formulating the research plan, collecting the research data, and drawing proper conclusions from the results obtained. One's biases and prejudices must be rigorously suppressed. Hypotheses should be stated after careful thought then tested with complete impartiality. One should be as willing to reject as to accept such hypotheses as the results justify.

To illustrate this point of view, Francis Bacon's self-analysis (1) is appropriate: "I possessed a passion for research, a power of suspending judgment with patience, of meditation with pleasure, of assenting with caution, of correcting false impressions with readiness, and of organizing my thoughts with scrupulous pains. I had no hankering over novelty, no blind admiration of antiquity. Imposture in every shade I utterly detested. For all these reasons, I considered that my nature and disposition had, as it were, a kinship and a connection with truth."

#### Conclusion

We do need to improve the effectiveness and prestige of therapeutics and corrective exercise by full realization of our scientific resources. As General Omar Bradley once said, "... it is time we steered by the stars, not by the lights of passing ships."

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2. Atchley, Dana W., *The Healer and the Scientist*. *The Saturday Review*, XXXVI, No. 2, January 9, 1954.
3. *Life*, October 7, 1957, p. 80.

#### DAY CENTER SPONSORS WORK THERAPY

A new work-therapy program to help selected psychiatric patients "earn" their way back to productive living has begun at the day center of the outpatient clinic of the Veterans Administration regional office in New York City. It enables them to be paid wages for simple work assembling pens, necklaces, and other items for local manufacturers as part of physical medicine and rehabilitation therapy at the clinic. The patients spend about three hours per day in the program and the remainder of their day in other rehabilitation activities.

Dr. Sylvan A. Frankenthaler, director of the clinic, said the work is proving to be a valuable form of therapy and has been received with enthusiasm by the veterans. He said patients who had displayed little interest and hope are showing marked increase in alertness and morale.

Dr. Frankenthaler emphasized that money is not the main objective of the program but only serves as a motivating force to help the disabled veterans reclaim their positions in society. "This form of therapy," he said, "bridges the gap between the hospital and community life and simulates actual industrial conditions, making the transition to a real job much easier for the patients."

#### CANADIAN AND AMERICAN AGENCIES SPONSOR NEW BOOK ON PARKINSON'S DISEASE

A book that may become a landmark in the study of Parkinson's disease has just been published by the McGill University Press, Montreal, Canada. Titled *The Shaking Palsy*, it is drawn from the symposium on Parkinson's disease held in Montreal in October, 1959, under the auspices of the United States Veterans Administration and the Department of Veterans Affairs of Canada.

Editors of the book are Dr. Blaine Nashold, chief of the neurosurgical service of the VA hospital at Durham, N. C., and assistant professor of neurosurgery at Duke University School of Medicine, and Dr. Harold Elliott, neurological surgeon-in-charge at Queen Mary Veterans Hospital, Montreal, director of the department of neurology and neurosurgery at Montreal General Hospital, and assistant professor at McGill University.

Parkinson's disease is a major problem in medical care of war veterans, and newer methods of treatment for it are under study of both the VA and the Canadian Department of Veterans Affairs. The two agencies have exchanged medical information for over a decade.



## Neurological Case History of a Champion Athlete\*

(Double Olympic Silver Medal Winner and European Champion in Equestrian Dressage Contest with Extensive Bilateral Paretic and Paralytic Sequelae of Poliomyelitis)

ERNST JOKL, M.D.\*\*

Erwin Straus (1) has pointed out that much of our present knowledge of the human mind, of the "eidon" of the mental world of man, is based upon psychiatric researches. The latter reveal an "anti-eidon," a corresponding opposite of the pattern of the norm. Similarly, the first comprehensive theories of the physiology of the motor act are currently being derived from movement studies of handicapped individuals. Among these are champion athletes of unsurpassed powers. The fact that in the presence of major physical defects the attainment of superb performances is possible such as normal "unhandicapped" persons are unable to equal represents a conceptual challenge of the first magnitude. Harold Connolly (2), who suffers from a combined upper and lower brachial plexus paralysis on the left side, won the hammer throw at the 1956 Olympic Games in Melbourne. Karoly Takacs (3) became Olympic and world champion in pistol shooting in 1948 and 1952, performing with the left arm after he had lost the right with which he had originally established his athletic fame. The present communication is concerned with a description and interpretation of the case of Mrs. Lis Hartel, who became the greatest tournament equestrienne of our time after being afflicted with poliomyelitic paralyzes of all four extremities.

### Summary of Case History

Seventeen years ago Mrs. Hartel, who was then 23 years of age and four months pregnant, was stricken with poliomyelitis. During the acute stage of the disease, the respiratory muscles, the eye muscles and all four extremities were paralyzed. Within the ensuing weeks there occurred a partial improvement though pareses and paralyzes distributed over trunk and all four extremities remained as permanent sequelae of the illness. The pregnancy proceeded normally and in March, 1945, the patient gave birth to a healthy child.

\*For Professor Erwin Strauss on the occasion of his 70th birthday.

\*\*University of Kentucky, Lexington, Kentucky.

†Grateful acknowledgement is made of the collaboration by Professor Erling Asmussen, Copenhagen, who has supplied the information contained in Tables I and II.

††"In the energy-pattern which is the brain, two sets of events happen such as to human knowledge, happen nowhere else the perceptible universe over. In that universe, sampling it on our planet's side, ourselves compact of energy, nowhere does our glimpse detect in all the immensity of energy any relation of energy except to energy—save in this one instance, the brain." Sherrington (6)

Mrs. Hartel had been an accomplished equestrienne prior to the disease. Four weeks post partum she resumed horseback riding. In 1947, while still walking with the help of crutches, she took part in a riding competition in Norway. Early in 1948, a panarthrosis of the right ankle joint was undertaken, followed one year later by a subtaloarthrosis on the left side. After recuperation from the operations, the patient managed to move about with standard foot gear.

At the 1952 Olympic Games in Helsinki, Mrs. Hartel won the silver medal, and in 1954, became European champion in the dressage competition. At the riding tournament in Stockholm in 1956 she was awarded a second silver medal, a success without equal in the annals of this sport.

At a re-examination in 1961 general impairment of muscular power was noted, most markedly so in the abductor muscles of the hips and in the flexor muscles of the knees. Normal strength was found only in the extensor muscles of the left knee joint.

Tables 1 and 2 summarize the results of clinical tests which were evaluated in accordance with the customary rating scale 1-5 and of dynamometric tests whose results were stated in kg or as kg x cm, and in percentage ratios of average values for healthy women of the same age.†

How can achievements like those by Mrs. Hartel, Mr. Connolly and Mr. Takacs be explained? Exercise physiology in its present state of development is based on the assumption that from quantitative measurements of partial functions of the body a synthesis of the performance in its entirety is possible. However, there are several good reasons to doubt the validity of such an assumption. One reason is that the physiology of human record performances is still a *terra incognita* since as Frucht (4) has pointed out, "the mobilization of the last power reserves of the organism which is a *conditio sine qua non* for top level athletic feats cannot be realized in laboratory experiments." The chief reason however is that of the incommensurability of the *mental* prerequisites and accompaniments of the motor performance of man, and its *measurable* manifestations. Only the latter fit into the energy equation of physics and mathematics††. The fifteenth century French physician Jean Fernel distinguished between 'the stage of the event and 'the event itself,' the latter representing a human category that lies outside the range of quantitative identification (5). In his book *Geschehnis und Erlebnis* (1930, page 8) Straus introduced this concept into neuro-psychiatry: "A human act cannot be evaluated in its entirety in accordance with the energy expenditure which it involves. It reveals its true



**CLINICAL EVALUATION OF MUSCLE FUNCTIONS**  
(Lis Hartel, March 6, 1961)

	Right	Left		Right	Left
<b>Neck</b>			<b>Scapula</b>		
Flexion	5	5	Serrat. ant.	5	5
Extension	5	5	Elevation of scap.	5	5
Stern. cl. mast	5	5	Trapezius — upper portion-Levator scap.	5	5
Scaleni	5	5	Trapezius — middle portion	4-5	4
<b>Abdomen</b>			Trapezius — lower portion	4-5	4
Rectus — pars superior	4-5	4-5	Rhomboidel	5	5
Rectus — pars inferior	4-5	4-5	<b>Shoulder</b>		
Obliquus int.	4-5	4-5	Supraspinatus	5	5
Obliquus ext.	4-5	4-5	Deltoides — ant. portion	5	4
<b>Back</b>			Deltoides — middle portion	5	4
Extension — upper portion	5	5	Deltoides — post. portion	5	4
Extension — lower portion	5	5	Pectoralis maj.	5	5
<b>Hip</b>			Latissimus dorsi	4-5	5
Flex. — Iliopsoas	4	4	Pronation of arm	5	5
Ext. — Glut. max	4	5	Supination of arm	5	5
Abduction — Gl. med. & min.	3+	3+	<b>Upper arm</b>		
Tensor fasciae	4	4	Flexion — Biceps	5	4
Adduction	5	5	Flexion — brachioradialis	5	4
Internal rotation	5	5	Combined flexion		
External rotation	5	5	Extension — triceps	5	4
<b>Knee</b>			<b>Lower arm</b>		
Medial flexors	4	5	Supination	5	5
Lateral flexors — Biceps	2	5	Pronation	5	5
Extension — Quadriceps	4	5	<b>Wrist</b>		
<b>Ankle</b>			Flexor carpi uln.	5	5
Plantar flexion — Soleus	*	**	Flexor carpi rad.	5	5
Plantar flexion — Gastrocnemius	*	**	Extensor carpi uln.	5	5
Dorsal flexion	*	**	Extensor carpi rad.	5	5
<b>Foot</b>			<b>Thumb</b>		
Supination — Tibialis post.	0	0	Adduction — add. poll.	4	5
Supination — Tibialis ant.	0	0	Abduction — abd. poll. long.	4	4-5
Pronation — Peroneus long.	0	1-2	Abduction — abd. poll. brev.	3-4	4
Pronation — Peroneus brev.	0	1-2	Flexion — flex. poll. brev.	4	5
<b>Toes 1</b>			Flexion — flex. poll. long.	5	5
Flexion	2-3	2-3	Extension — ext. poll. brev.	4	4-5
Extension	0	0	Extension — ext. poll. long.	4	4-5
<b>Toes 2-5</b>			Opposition — opponens poll.	1	4-5
Flexion	1	3	<b>Fingers 2-5</b>		
Extension	0	0	Adduction	4	4
			Abduction	4	5
			Flexion — Lumbricales	4-5	5
			Flexion — Flex. dig. sublim.	5	5
			Extension — Ext. digit. comm.	4-5	5
			Flexion — Flex. dig. prof.	5	5

\*Arthrodesis

\*\*Subtalararthrodesis

TABLE I

meaning by its purpose and by the values which it carries."

### Motivation

The assertion is frequently made that disabled persons are capable of gaining access to extraordinary motivational forces. However, no facts have been adduced in support of this hypothesis. Actually, strong evidence is available against the main supposition upon which such a theory would have to rest, viz. that untapped resources of motivational powers are universally present in non-disabled athletes: attempts to increase strength, endurance and skill of champion athletes through *hypnosis* have failed, while

in less accomplished sportsmen hypnosis has occasionally been effective.\*

\*The "Committee on Medical Aspects of Sports" of the American Medical Association has published a statement (July 1, 1960) to the effect that 'an athlete under hypnosis or as a result of post-hypnotic suggestion might be encouraged to go beyond the limits of his physical abilities and thus induce a state of harmful exhaustion.' There is no evidence on record to support the validity of such a pronouncement which reveals incidentally the need for a reorganization of scientific research on sports-medicine in the United States.

(The above mentioned statement by the AMA's "Committee on Medical Aspects of Sports" has also been sharply criticized by the President of the American Society of Clinical Hypnosis (Bulletin, ASCH, June 5, 1961) who drew attention to the arbitrariness of the assertion under reference.) For a competent discussion of the subject see Ikal, M., and Steinhaus A. H., "Some Factors Modifying the Expression of Human Strength." (J. Appl. Physiol. 16. (1): 157-163., 1961.)

# DYNAMOMETRIC MUSCLE TESTS

Name: Mrs. Lis Hartel

Date of Examination: March 6, 1961

Born: March 14, 1921

40 years

Height: 172.0 cm.

Weight: 58.5 kg.

Back 28.5 kg. (50% of normal av.)

Abdomen 30.0 kg. (70% of normal av.)

	left	% of normal	right	% of normal
Sidebending	28.0 kg.	75%	26.0 kg.	70%
Upper extremities				
Handgrip	290.0 kg.	80%	21.5 kg.	60%
Supination (wrist)	58.5 kgcm.	70%	31.0 kgcm.	35%
Pronation (wrist)	39.0 kgcm.	45%	30.5 kgcm.	35%
Horizontal pull	18.0 kg.	60%	20.0 kg.	65%
Horizontal push	10.0 kg.	50%	15.5 kg.	80%
Lower extremities				
Hip abduction	16.0 kg.	40%	11.5 kg.	30%
Hip adduction	22.5 kg.	65%	21.5 kg.	60%
Hip extension	27.0 kg.	80%	25.5 kg.	75%
Hip flexion	21.5 kg.	50%	27.0 kg.	65%
Knee extension	1132.0 kgcm.	100%	816.5 kgcm.	75%
Knee flexion	489.0 kgcm.	60%	249.0 kgcm.	30%
Leg extension	110.5 kg.	55%	102.5 kg.	50%
Leg extension (both legs)	174.5	(50% of	norm. aver.)	

Isometric muscle strength in absolute values and as percentages of average measurements from normal women of same age and height as Mrs. Hartel.

TABLE II

## Training

Training leads to the perfection of two different processes of physiological adjustment. The first concerns the transition from the resting state of the *autonomic* system, to its deployment during activity; from homeostasis to heterostasis\*. Secondly, the special pattern of the *neuromotor act* which the individual chooses as his goal crystallizes itself during training. Fundamentally these two processes, *i.e.* the autonomic and the neuromotor, are sundered even though they can be bonded together through training. A good long distance runner is unable to transfer his "endurance power" to cycling, nor can a

cycling champion excel in a channel swimming contest, or a channel swimmer in mountaineering, etc. A new kind of training effort is necessary to link the patterned universality of the *autonomic* responses to exercise—*e.g.* that which is reflected in enhanced endurance power—to the specificity of a chosen *motor act*.

## Homeostasis and Heterostasis

The study of the polarity of homeostasis and heterostasis has revealed not only the nature of the autonomic accompaniment but also the general physiological framework of the motor act. It has thrown light upon what Buytendijk calls "Das Menschliche der menschlichen Bewegung" (the human element of human movements (8).

The autonomic changes which accompany the transformation from the resting state to activity have been extensively examined in *animals* and described under such names as the "emergency function of the sympathico-adrenal system" (Cannon), "alarm reaction" (Selye), "sympathicotonic preponderance" (Eppinger and Hess), "ergotropy" (Atzler) or "adrenergic liberation of catecholamines" (Raab). In animal studies the activation of the neuromotor and

\*The term *homeostasis* relates to the "constancy of the inner environment of the organism at rest." Scope and content of this concept which was formulated by Claude Bernard one hundred years ago have only recently been realized. During exercise pulse rate, blood pressure, body temperature, blood sugar, muscle tone and oxygen intake, undergo a "heterostatic" deployment. The term "*heterostasis*" relates to the state of the organism during activity. In terms of autonomic balances homeostasis and heterostasis, each in its own way, assume a definite gestalt which in turn depends upon neuromotor influences. Autonomic functions at rest and during exercise are "streered" by what the Pavlovian school calls "the higher functions of the nervous system." In *human exercise physiology, the upright posture represents the homeostatic dimension of reference while the motor act determines the heterostatic deployment of the neuromuscular as well as of the autonomic systems.*(7)

autonomic systems that accompanies the transition from rest to physical activity involves *muscular reflex patterns*, such as those mobilized in running, or jumping, or in "rage." These activities are projected in accordance with performed nervous and humoral patterns. Their mobilization has been demonstrated experimentally in Sherrington's decerebrate rigidity studies, in the elicitation by Denny-Brown of "running movements" of the hind legs of the spinal dog, and in the electrically induced rage in Hess' thalamic cats.

A very different situation is encountered in respect of the "focal act" of man\*. In terms of its evolutionary history, the physiological mechanism of transition from rest to exercise represents an "old" acquisition. This statement applies to the autonomic changes which accompany reflex movements in animals as well as in man. But in man this mechanism can also be channelled into *constructed behavior*, i.e. behavior that has been acquired through individual synthesis of a motor gestalt patterned in the image of a concept.

Scope and meaning of the *human* motor act cannot be fully encompassed from animal studies. The study of the transition from motor homeostasis to motor heterostasis as accompaniment of "focal" acts necessitates consideration of a specific category of mental experiences.

#### "Disciplined Disinhibition"

Athletic record performances represent examples of a specifically human aspect of neuromotor activation, viz. that of a "disciplined disinhibition of the central nervous system." Depression of "dynamic" motor impulses is one of several functional characteristics of the maintenance of stance, and generally

\*There are, Sherrington writes, grades of acts. We think of ourselves as engaged from moment to moment in doing this or that. This is a convenience of speech. At any given time there is but one "*focal doing*" which presents the keypiece of the performance to which all other motor events are subordinate. The crack pistol shot can hit his target whether he stands, sits, or lies. Postures and movements that are but contributory to the focal act are called "satellite movements." Satellite movements fit into the total pattern of the act—but they do not enter the field of awareness. Only to the "focal act" can awareness be attached and if so to but one act at a time. No individual is ever the seat of two focal acts at once, nor can two events be simultaneously recorded as memory traces. Both the main act of the moment and the memory trace enjoy a special position.

The main act seems to each of us, amid a natural world which we do not control, a happening which we do control. It seems to me I do it not at the dictation of the inevitable. In turning to it I do not seem to myself to be merely carrying out something already completely fixed for me by the past. I am restricted to one such act at a time, for it is always an act which demands my fully integrated self. I cannot therefore break away from a deterministic world in several directions at once. As to the one main act which I am allowed it seems to me I have freedom of choice.

of static postural alignment of the skeletal musculature at rest; while rapidly changing motor discharges are ubiquitous prerequisites of muscular activity (9). Pavlov spoke of "positive and negative induction," alluding to the experimentally demonstrable fact that stimulation in one division of the central nervous system is likely to cause depression in another. This principle applies in general to the functional antagonism between static and dynamic motor situations, as well as to the polarity of homeostatic and heterostatic preponderance in the structure of the motor act. Its basic neurophysiological implications have been discussed elsewhere (10).

#### Limitations of Measurability

In the case of highly differentiated "acquired" performances of man such as those involved in competitive athletics and in functional restoration through rehabilitation, the process of central nervous disinhibition during exercise aims at the perfection of "focal" motor acts through training. It is only to this category of "focal" acts—in contrast to reflex movements—that value qualities of corresponding specificity can be attached. *In the last resort this aspect of human action is not amenable to quantitative and objective demonstration.* It therefore is not receiving consideration in contemporary physiology. However, it is this very aspect which characterizes the "stigmatized" nature of every distinguished motor achievement, with its exceptional motivation and staying power, devotion and industry. The latter are the decisive driving forces behind all outstanding performances. Those features of the motor act which lend themselves most readily to measurement and to objective demonstration are the ones to which little or no specific relevance attaches on the introspective level. In as far as human motor acts—artistic, athletic, ritualistic—are distinguished by a preponderance of *individually synthesized over reflex control*, their "human structure" is correspondingly distinguished by greater differentiation.

In terms of neurophysiological and neuro-psychiatric thinking the facts under study emphasize the *hierarchical dominance* in the direction of all integrative human performances, *of the sensory over the motor control functions* of the central nervous system. This is the decisive physiological conclusion which I draw from the observations of the 'disabled' champion athletes. These observations as well as the conclusions derived from them are bound to exert the most far reaching influence upon conceptual thinking that has been brought to bear upon the physiology of exercise in the twentieth century so far. A new theoretical picture is emerging, a picture which fits admirably into the pattern that has been evolved in the past ten years or so in neuropathophysiology or, to use a term recently revived by John McFie (Lancet, August 12, 1961, pp. 360 ff.), in 'phrenology'. Evidence based upon psychological studies on patients afflicted with cerebral disease shows that 'precentral lesions generally result in less test impairment than do post-central lesions'. (cp. Morrow, R.S. and

Mark, J.C., *J. cons. Psychol.*, 1955, 19, 283; and Chapman, L.F. and Wolff, H.G., *A.M.A. Arch Neurol*, 1959, 1375). It can no longer be disputed that the integrative component of neuro-muscular control represents an incomparatively more relevant determinant of the measurable 'kinetic' outcome — e.g. in terms of times, distances, 'rank' etc. in athletics — than any results derived from single or multiple factor analyses of 'mechanical' or 'energetic' units, within the complex of physiological events. Because of the fact that the latter offer themselves more readily for direct physical or mathematic assessment than does the integrative process, the fundamental distinction between the two categories has only lately become apparent. Manifestations of power, of time and of related temporo-spatial aspects of the human performance are, as it were, but projections of its integrative gestalt which as such is highly variable, exchangeable and 'plastic', to apply an established neurophysiological expression. The validity of the latter statement extends to the autonomic accompaniments of the motor act in its entirety, a conclusion supported by observations of outstanding athletes with abnormal cardio-vascular systems (cp. Jokl, *Cardiovascular Responses to Exercise* Concerned in Rehabilitation of Cardiac Patients, *Am.J.Cardiol.*, 7:3:320-29, March, 1961).

### The Problem of Choice

"...mais quelle sera la vie d'une jeune fille boiteuse?..."

Wer wird sie sein, wenn einmal das Gebrechen,  
das sie jetzt tragt, wie eine kurze Laune  
zu der ein Kind erfindend sich verstellt,  
ihr gleicht und immer nachgeht im Geraune?  
Und sie, als Madchen, wird vor aller Welt  
auf ihren Stock gestutzt, versprechen  
sich still zu halten. Wird ihr Mund  
von des Verzichtes Bitterkeit sich biegen?  
Wird sie die Nachte neidisch liegen,  
um tags von Wunschen sich gesund  
tauschen zu lassen? Oder wird sie siegen?

Denn dieser kleine wehe Unterschied  
mit dem sie aufwachst, der bei jedem Schritte  
sie heimlich abseits von der andern zieht  
und taglich will, dass sie ihn neu erlitte  
kann nicht vernichten; kann sie nur entfernen.

Sie ist so leicht; zieht er sie weit genug,  
so wird sie den unendlichen Bezug  
viel fruher als die Freundinnen erlernen,  
und selig jeden Morgen von den Sternen  
sich wiederkommen, innen voller Flug.\*

Rainer Maria Rilke, *Gedichte aus dem Nachlass.*  
*Insel Almanach* 1952, p. 36.

\*But what will be the life of the limping young girl? . . .

Will her lips grow pursed by bitterness of deprivation?  
Will she lie awake envious at night.  
In daytime will her wish deceive her,  
make her well?  
Or will she overcome her handicap?

For this small grievous difference  
will grow up with her, will at every step  
silently lead her aside from the crowd,  
will daily make her suffer it anew.  
Cannot destroy her; only lead her on.

She is so light; if far enough it leads  
she will eternally and all it means  
more quickly grasp than all her girlish friends,  
and blessed every morning she will come  
back from her stars, wearing her wings inside.

(translation by Berta Badt-Straus, Shreveport, La.)

The challenge to which Rilke alludes in the question directed by him to the crippled girl confronts every handicapped person. Von Weizsacker once wrote "*Ein Subjekt kann, ja muss wahlen*" (A person can, indeed must, choose (11). Miller (12) has

dwelt upon the problem of "continuing incapacity despite medical recovery," often encountered in patients who achieve good medical or surgical convalescence but fail to return to a life of useful activity. He pointed out that injury or disease invariably cause the patient to reconsider his convictions as to his worthwhileness, the merit of his attainments and the true value of his plans and hopes. An individual's sense of his own worth, he says, is traditionally tied to bodily intactness. Those whose bodily intactness is disturbed are more likely to realize that satisfactions and self-esteem are derived largely from what we can do, where we can go, how much we have achieved, and what we may anticipate. Such introspective considerations greatly influence the course of recovery after injury and generally the outcome of rehabilitative training\*.

### The Wisdom of the Body

Effective rehabilitation is possible only in individuals who have set their own goals. Such goals are not "biologically" fixed in accordance with what Ernest Starling has called "The Wisdom of the Body", a wisdom reflected in a preordained pattern of adjustment whose "inner logic" reveals itself to the student of physiology by the apparent purposiveness of the responses of the organism to environmental stimuli. However, the "ratio" derived from experimental physiology is not synonymous with the "ratio" of St. Augustine. When we speak of "The Wisdom of the Body" we do not speak of the wisdom of man. In one of his famous epigrams Pascal wrote that "the heart has its reasons which the reason knows not." Job was unable to say "who hath put wisdom in the inward parts? or who hath given understanding to the heart?" (Job 38:36); while metaphors like "The Spirit of Man is the Candle of the Lord" (Proverbs 20:27) are applicable to the fact that through images and symbolic representations "human reason" can evaluate the human situation. In its autonomic responses to physiological challenges, the body relies altogether on the "wisdom of the inward parts." The challenge of rehabilitation appeals to the "spirit of man."

\*"To know something means to determine the factual in relation to the potential, the particular in relation to the general, the part in relation to the whole. A knowing being is one no longer bound to actuality. To know what something is implies realizing what it could be but is not. To know the world implies knowledge of oneself. One is not without the other. The Bible tells us in a lapidary style that knowledge—scientia—is accompanied by conscientia, conscience. The fruit from the tree of knowledge bestowed upon man the power of self-reflection. He saw himself as in a mirror and was not pleased with what he saw. He discovered the discrepancy between the actual condition and a better one, between fact and ideal." (13)



## Symbolic Representation

Symbolic representations, Straus says, "enable us to break through the barriers which are set by our corporeal existence." (14) We are able to conceptualize diversified and fractionalized constellations and view them as entities. A map of the United States presents to us the country as a whole in its extension between the two oceans. Discarding natural size, the map delivers into our hands the spatial order of the whole scale adapted to our natural limits. A map of New York equalling the city in size would be of no use. Symbolic representation gives us power over that whole of which we are but a tiny part."

Our ability to break through the barriers of our own corporeal existence is not inborn. It must be acquired. A Kaspar Hauser\* would not have been able to "rehabilitate himself" if he had been confronted with a disabling affliction such as Mrs. Hartel's. Rehabilitation presupposes knowledge of ourselves, gained by observation and social contact, extracted and retained and evaluated by us through images and symbolic representation. Mrs. Hartel's rehabilitative achievements were preceded by her awareness of the specific nature and value of the fascinating world to which she had gained access as an equestrienne prior to the illness. In setting the goal for her recovery she took recourse to this knowledge of her past and derived from it confidence into her ability to recreate it\*\*.

The motor act, Sherrington (15) observed, "puts a bud into futurity." But also there is lent to it something of the past. Human movements are set as between a future and a past. They have temporal

\*Kaspar Hauser appeared in the streets of Nuernberg on May 26, 1828. He was about 16 years of age and though it was subsequently established that he was of fair intelligence, he could not talk and lacked knowledge such as every normal boy possesses. The well-known jurist Anselm von Feuerbach took the youth into his home, where he soon learned to speak. He said that his name was Kaspar Hauser and that as long as he could remember he had been sitting in a dark room. His story immediately attracted the curiosity of the public. The assertion was made that he had been born Crown Prince of Baden and that the Countess von Hochberg wanted to get rid of him. On October 17, 1829, Hauser was attacked in the street by an unknown person and stabbed with a knife. In 1831 the British Lord Stanhope adopted him and placed him under the care of Mr. J. G. Meyer, a school teacher, in Ansbach, Germany, who taught him to write and who arranged for his employment in the office of the local court house. The young man's mental abilities remained limited. On December 14, 1833, he came running home with a severe wound in his chest caused by a dagger. He died three days later.

In 1875 Emperor Wilhelm I ordered the publication of all information on Kaspar Hauser that could be found in the Archives of the State of Baden. At present, forty-nine large volumes dealing with "The Case of Kaspar Hauser" are deposited in the State Archives in Munich.

\*\*"The thought," Heinrich Heine (16) wrote, "precedes the deed so as lightning precedes thunder."

as well as space relationship. They are part of our own history. The rehabilitative process, concerned as it is with the motor act, bears no relation to the "healing process" as it is otherwise understood in clinical medicine, e.g. to the formation of scar tissue, the growth of a callus, or the epithelialization of a surface defect. *Rehabilitation introduces a physiological concept into clinical pathology.*

## The Nature of Memory

Straus has shown that memory is selective. Of our daily actions, we generally do not retain detail but prefer to remember "the whole" and "the remarkable." To register, he says, means to disengage and to arrest the fleeting from the continuum of confrontations with the world. If it is to be remembered, the event must be different and separable from all other things experienced or known heretofore; it has to have "marks of distinction"; marks which the observer can identify. Yet, he says, not each and every difference makes an event remarkable. There must be a significant change, a revolution if you like, in the flow of events of our lives. Straus' thesis is that only the new, or the *Novum*, can be disengaged; arrested, and therefore registered and later recalled and remembered.

The *Novum* cannot be measured. It represents an experience, a specifically human happening of 'historical dimensions.' As to the memorability of motor events, only "focal acts," not reflex movements, can thus be "disengaged".

## Memory Traces and Staff Notation

In music, trace entities have been used for centuries to facilitate the projection of motor concepts into motor acts: In the traditional system of staff notation each printed musical note represents the equivalent of a memory trace. At the height of their concert careers some of the greatest pianists of this century, among them Busoni and Gieseking (17), could memorize a composition simply by looking at the score sheet. They thus learned to play it even without having practiced it manually. In 1961, Oxford University Press published an outstanding textbook by the great viola virtuoso William Primrose under the meaningful title *Technique is Memory*. It deals with "the relationship between memory, concentration and accuracy and the topography of the fingerboard."

Techniques of motor performances in sport and athletics have as yet not been conceptualized and notated in comparable detail. Athletes still improvise their own movements though they do so within

the framework of general rules for the various events, e.g. for a dressage competition in horseriding, for throwing the hammer, or for target shooting. They are guided in their training by empirical knowledge such as is conveyed to them by coaches and fellow athletes. Their situation is comparable to that of the seventeenth and early eighteenth century organists who relied on contrapuntal outlines of thematic material placed before them. While playing on the organ, they detailed and modulated the material in accordance with their technical knowledge and with their interpretative abilities. Johann Sebastian Bach, Haydn, Mozart and Beethoven, who made decisive contributions to the development of musical staff notation, were nevertheless still famous as "improvisers" on the keyboard. They had no difficulty in arranging their own transcription, and in varying a given theme. The last great composers who were able to do so were Felix Mendelssohn and Johannes Brahms. However, the ability to improvise the execution of a motor concept from "sketches," to specify it and to give it individual character, is and will always be a basic characteristic of exceptionally gifted

men and women. This ability also represents one of the hallmarks of the talent of great athletes.

### *The Learning Process in Music and Athletics*

As a result of the perfection of staff notation, the student of music today has access to the collective technical and esthetic experiences of the past. The athlete cannot to the same extent benefit from the skill and knowledge gained by others. However, the progressive improvement during the past decades of all performances in sport is in part due to the advancement of techniques of what Medawar (18) calls "extrasomatic hereditary communication," through techniques which conceptualize and record acquired information and render it accessible to every beginner.\* Attempts to elaborate a system of staff notation of movements in physical education, sport and athletics have not yet yielded results that are comparable to those which in the past two and a half centuries have led to such remarkable developments in communication of music. Promising efforts in the graphic representation of motor performances have been made in choreography as well as in the transcription of the

\*"A child at conception receives certain genetical instructions from its parents about how its growth and development are to proceed. Among these instructions there must be some which provide for the issue of further instructions; I mean, a child grows up in such a way that it, too, can eventually have children, and convey genetical instructions to them in turn. We are dealing with a very special system of communications: a hereditary system. There are many examples of systems of this kind. A chain letter is perhaps the simplest: we receive a letter from a correspondent who asks us to write a third party, asking him in turn to write a letter of the same kind to a fourth, and so on — a hereditary system. The most complicated example is provided by the human brain itself; for it does indeed act as intermediary in a hereditary system of its own. We do more than learn: we teach and hand on; tradition accumulates; we record information and wisdom in books.

Just as a hereditary system is a special kind of system of communication — one in which the instructions provide for the issue of further instructions — so there is a specially important kind of hereditary system: one in which the instructions passed on from one individual to another change in some systematic way in the course of time. A hereditary system with this property may be said to be conducting or undergoing an evolution. Genetic systems of heredity often transact evolutionary changes; so also does the hereditary system that is mediated through the brain. I think it is most important to distinguish between four stages in the evolution of a brain. The nervous system began, perhaps, as an organ which responded only to elective stimuli from the environment; the animal that possessed it reacted instinctively or by rote, if at all. There then arose a brain which could begin to accept instructive stimuli from the outside world; the brain in this sense has dim and hesitant beginnings going far back in geological time. The third stage, entirely distinguishable, was the evolution of a non-genetical system of heredity, founded upon the fact that the most complicated brains can do more than merely receive instructions; in one way or another they make it possible for the instructions to be handed on. The existence of this system of heredity — of tradition, in its most general sense — is a defining characteristic of human beings, and it has been important for, perhaps, 500,000 years. In the

fourth stage, not clearly distinguishable from the third, there came about a systematic change in the nature of the instructions passed on from generation to generation — an evolution, therefore, and one which has been going at a great pace in the past 200 years. I shall borrow two words used for a slightly different purpose by the great demographer Alfred Lotka to distinguish between the two systems of heredity enjoyed by man: endosomatic or internal heredity for the ordinary or genetical heredity we have in common with other animals; and exosomatic or external heredity for the non-genetic heredity that is peculiarly our own — the heredity that is mediated through tradition, by which I mean the transfer of information through non-genetic channels from one generation to the next."

"A number of parallels can be drawn between the two forms of heredity and evolution. Just as biologists speak in a kind of shorthand about the 'evolution' of hearts or ears or legs so we can speak of the evolution of bicycles or wireless sets or aircraft with the same qualification in mind: they do not really evolve, but they are appendages, exosomatic organs if you like, that evolve with us. And there are many correspondences between the two kinds of evolution. Both are gradual if we take the long view; but on closer inspection we shall find that novelties arise, not everywhere simultaneously — pneumatic tyres did not suddenly appear in the whole population of bicycles — but in a few members of the population: and if these novelties confer economic fitness, or fitness in some more ordinary and obvious sense, then the objects that possess them will spread through the population as a whole and become the prevailing types. In both styles of evolution we can witness an adaptive radiation, a development into different environments: there are wireless sets not only for the home, but for use in motorcars or for carrying about. Some great dynasties die out — airships, for example, in common with the dinosaurs they were so often likened to; others become fixed and stable: tooth brushes retained the same design and constitution for more than a hundred years. And, no matter what the cause of it, we can see in our exosomatic appendages something equivalent to vestigial organs; how else should we describe those functionless buttons on the cuffs of men's coats?" (P.B. Medawar, *The Future of Man*, Methuen, London, 1959, 95-96.)

modern dance, of gymnastics and of calisthenics. Such universal memory traces as are available, do serve every athlete as guides during his training, e.g. through coaching books, teaching charts and descriptive illustrations. While in its present form the effectiveness of such material is still limited, it is nevertheless of considerable didactic value.

In the motor learning situation the handicapped trainee is *a priori* at a disadvantage. He generally lacks the security and safety that is inherent in the normal bodily state. That under exceptional circumstances he can turn his disability into an asset is an observation of singular neurophysiological significance.

#### *Coding and De-Coding of Nervous Impulses*

Throughout his training the handicapped—as compared with the unhandicapped—person is compelled to become aware and thus placed in a position to arrest a greater number of focal acts from the continuum of confrontations. To apply Straus' statement on remembering, the component motor events of the athletic performance are separable to the handicapped by a greater number of marks of distinction than those which are "remarkable" to the unhandicapped athlete. No textbook of physical education and coaching identifies situations that are thus distinguished because to the "normal" sportsman they are not similarly "remarkable." Only for the crippled performer are they *Nova*, disengaged from the fleeting continuity of the *curriculum vitae*, and are more likely to be registered so that they can later be recalled and remembered. *The defectiveness of the bodily state of the physically handicapped may thus enhance his motor learning potential.* This is the neurophysiological explanation of the great, and at times, dramatic transformation which exceptional individuals like Mrs. Hartel, Mr. Connolly and Mr. Takacs bring about with the transition from the homeostatic to the heterostatic motor situation.\*

In general neurophysiological terms the issue pertains to the relations between stimuli and motor performances, and to the question how the nervous system integrates for action any part of the motor system that is available. Adrian (19) has pointed out that we cannot represent the integrative process unless we take into account the functional mechanism of communication between central nervous system and striated musculature; and between peripheral receptors and brain. On the sensory side, he says, there must be something to *abstract the significant elements of a pattern*; and on the motor side some-

thing to do just the reverse, *viz. to convert the abstraction into a concrete movement.* The two correspondingly opposite processes of coding and decoding involve different kinds of assemblages of impulses in normal and in crippled athletes.

#### *The Upright Posture\*\**

The evaluation of Mrs. Hartel's achievement would be incomplete without an attempt to interpret its *subjective* significance (20). For this remarkable woman the ascent to the summit was exceptionally long and difficult. Its route had not previously been mapped. By declaring her the greatest equestrienne in the world, the Olympic tournament judges rated but the *communicable* aspect of her athletic performance, "*the theatre of the event*," to quote once again Fernel's felicitous phrase. What about the nature of the *event itself*?

It will be recalled that for a time Mrs. Hartel had been deprived of the power to maintain her upright posture. Upright posture, Straus (21) wrote, not only involves many technical problems of stance and of locomotion. It also "carries" a meaning that is not exhausted by the physiological tasks of meeting the forces of gravity and keeping the equilibrium. In the situation under reference the presence of the physical disability emphasized rather than detracted from the patient's determination to re-establish her former status. "Downcast," she decided to "rise" again.

The direction upward, against gravity, inscribes into space world-regions with spatial-emotional values, such as those expressed in high and low, rise and decline, climbing and falling, superior and inferior, elevated and downcast, looking up to and despising. On Olympus, high, remote, inaccessible, exalted, dwell the Homeric gods. On

\*Though it must be reiterated that Mrs. Hartel had been an accomplished horsewoman before she became ill, she attained her great triumphs, *viz. the European championship and the two Olympic Silver Medals, afterwards.* She may indeed say:

Out of this nettle, danger,  
I pluck thee flower, victory.

(King Henry, IV, Part I, III, 11.)

\*\*The term "to be upright" has two connotations: to rise, to get up, and to stand on one's own feet; and the moral implication, not to stoop to anything, to be honest and just, to be true to friends in danger, to stand by one's convictions, and to act accordingly, even at the risk of one's life. We praise an upright man; we admire someone who stands up for his ideas of rectitude. There are good reasons to assume that the term "upright" in its moral connotation is more than a mere allegory. (Straus)



Mount Sinai, Moses receives the Ten Commandments. Below in the depth is Hades and the world of shadows. There, also, is the Inferno (22)\*

### Phenomenological Evaluation

No technical measurements, no rating system and no mechanical analyses of Mrs. Hartel's tournament performances reflect the full significance of her triumph. "In getting up," Straus says, "man gains his standing in the world." Early in our lives we all gain our standing in the world, when our quadrupedal mode of existence comes to an end and the vertical body axis becomes the final dimension of reference for our actions. Mrs. Hartel went through the process of getting up for a second time, guided by her own determination and not, as is the case with the infant, by forces that are "self-engendered" through reflex mechanisms.

In so far as the permanent nature of the impairment limited range and power of her movements, Mrs. Hartel relied upon her unmatched mastery of the horse to regain her uprightness. In Rilke's words, the "small grievous difference could not destroy her," and riding high she "came back from her stars, wearing her wings inside."

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\*Two stanzas from Goethe's "Faust" allegorize the "spatial-emotional" antagonism of which Straus writes:

#### Part II, Act I, Scene 3. Trunkener (unbewusst)

Wie und wo ich mich vergnüge  
Mag es immerhin geschehn;  
Lasst mich liegen, wo ich liege,  
Denn ich mag nicht länger stehn.

#### Part II, Act V, Scene 4. Lynkeus der Turmer (Auf der Schlosswarte singend)

Zum Sehen geboren,  
Zum Schauen bestellt,  
Dem Turme geschworen,  
Gefällt mir die Welt.  
Ich blick in die Ferne,  
Ich seh in der Nah  
Den Mond und die Sterne,  
Den Wald und das Reh.  
So seh ich in allen  
Die ewige Zier,  
Und wie mirs gefallen,  
Gefall ich auch mir.  
Ihr glücklichen Augen,  
Was je ihr gesehn,  
Es sei, wie es wolle,  
Es war doch so schon.

#### Drunkard (half conscious)

How and where I am contented,  
May I, may I always be.  
Let me lie here, where I'm lying,  
For no longer can I stand.

#### Lynceus, the tower-keeper (singing on the watch tower)

For gazing created,  
For seeing placed here,  
And sworn to this tower,  
Me pleases the world.  
I gaze on the distance,  
I' the neighbourhood look,  
On moon and on stars too,  
On forest and deer.  
And beauty eternal  
In all of them see,  
And as they have pleased me  
Myself too I please.  
Whate'er ye have gazed on,  
Ye happiest eyes,  
Be't whatever it might be  
It always was fair!

(Leopole J. Bernays, Translator, John Wertheimer and Co., London 1839.)

The English translation fails to convey the artistic quality of the original. Several other translations were scrutinized and found similarly wanting. "Poetry is that quality which gets lost in translation" (Robert Frost).



# PHYSICAL FITNESS OF THE MENTALLY ILL: THE EFFECT OF HOSPITALIZATION

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## Introduction

As a result of increased interest in the physiological correlates of mental illness, studies have appeared recently concerning the relationship of mental illness and that operationally defined group of factors called "physical fitness." It has been established that the level of physical fitness of the hospitalized mentally ill is considerably below that of the general population (1, 2). However, the question remains as to whether individuals hospitalized because of psychopathology are in a state of subnormal physical fitness as a consequence of hospitalization or if a low level of physical fitness goes hand-in-hand with psychopathology. It is believed that this problem is of importance both in terms of our understanding and treatment of the mentally disturbed person.

A study by Linten, *et. al.* (3) revealed that hospitalized psychiatric subjects scored significantly lower on the Schneider Cardiovascular Test than did staff members. These findings were explained in terms of a decrease in physical activity of the patients resulting from hospitalization rather than as a basic concomitant of psychopathology. Hodgdon and Reimer (2) as well as the present investigators have questioned this explanation and believe that it is an hypothesis in need of empirical testing.

## Purpose

The present study is an attempt to determine whether the below-normal physical fitness of psychiatric patients is a direct result of hospitalization or is intimately related to psychopathology. One method of shedding light on this problem is to ascertain if a significant difference exists between the physical fitness of hospitalized psychiatric patients as compared to the physical fitness of mentally ill individuals at the time of their admission to the hospital. Added credence may be placed in the hypothesis that psychiatric patients decline in physical fitness because of hospitalization if the group of hospitalized psychiatric patients are significantly poorer in physical

fitness than the group of mentally ill individuals whose level of physical fitness was ascertained on admission to the hospital. On the other hand, if no significant difference in physical fitness is found between the two groups of patients, it can not be reasonably maintained that psychiatric patients decline in physical fitness as a result of decreased physical activity during hospitalization.

## Procedure

For the purpose of this study, two groups of subjects were formed. The first group (hereafter designated as H) was composed of 59 male patients ranging in age from 24 to 50 who had been hospitalized from 1 to 8 years with a mean of 29.2 months hospitalization and had not participated in a systematic exercise program. The other group (hereafter designated as A) consisted of 62 males between the ages of 20 and 50 recently admitted to this hospital. In order to differentiate the two groups more sharply as to the variable under study, no patient was included in group A who had been hospitalized within a year prior to the present admission. Only patients with a staff diagnosis of schizophrenia were included in both groups. Patients having an organic brain disorder and/or physical disability in addition to their functional psychosis were excluded from the study.

The relatively simply administered, standardized battery of tests developed by Rogers (4, 5) was used to assess the physical fitness of the subjects. This battery includes tests of the muscular performance of the forearms, upper arms, shoulder girdle, back, legs, and a test of lung capacity. The standardized procedure outlined by Rogers was followed to obtain a Physical Fitness Index (PFI) for each subject. By following this procedure, a score of 100 is normal or an average PFI.

This test of physical fitness was administered to each subject by a certified corrective therapist experienced in the utilization of this test battery. The testing of all patients in group A was accomplished within three days after their admission to the hospital.

## Results

Table I shows that the recently admitted patients (A) attained a mean PFI of 59.56 and their scores

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GROUP	N	AGE		PFI	
		Range	Mean	Range	Mean
A	62	20-50	35.2	24-99	59.56
H	59	24-50	36.2	23-85	54.70

Age and PFI  
of Recently Admitted (A) and Hospitalized (H) Patients

TABLE I

ranged from 24 to 99. The patients hospitalized for a period of from 1 to 8 years (H) had a mean PFI of 54.70 and a range of scores from 23 to 85. In order to determine the statistical significance of the difference between the means of the two groups, a "t" test was made (6). The obtained t of 1.72 revealed that the mean difference does not reach the 5% level of significance. Therefore, it may be said that the two groups of subjects do not differ significantly in respect to the measured trait.

#### Discussion

This study indicates that there is no significant difference between the level of physical fitness of hospitalized psychiatric patients and patients recently admitted to the hospital because of psychopathology. Therefore, the explanation advanced by Linten and his co-workers that the low physical fitness scores of psychiatric patients is a result of hospitalization is not substantiated by the findings of the present study. Rather, it seems clear that there is a direct relationship between severe mental illness; viz., schizophrenia, and a below normal level of physical fitness irrespective of whether the individual has undergone relatively prolonged hospitalization.

One aspect of the present study as compared with the general findings of Hodgdon and Reimer (2) is in need of brief analysis. The mean PFI of our hospitalized psychiatric group (H) was 54.70 whereas a mean PFI of 70.6 was attained by the patients in the aforementioned study. However, three of their patients scored over 100 and one of these attained a score of 140. Thus, it may be expected that these extreme scores inflated the mean PFI of their group of patients. As far as can be determined by the distribution of scores presented by Hodgdon and Reimer, if a median PFI was determined for their group rather than a mean PFI the average score of their patients would be similar to the average score of our H group.

As no breakdown of psychiatric diagnosis is presented in the study by Zankel and Field (1), no direct comparison of the mean PFIs can be made be-

tween the two studies. It should be noted that the subjects in our report are diagnosed as schizophrenic and generalizations to other nosological groups should be made with caution.

#### Summary and Conclusions

In order to test the hypothesis that psychiatric patients decline in physical fitness as a result of hospitalization, a comparison as to physical fitness was made between a group of 59 schizophrenic patients hospitalized from 1 to 8 years and a group of 62 admission patients diagnosed as schizophrenic. The Rogers Physical Fitness test battery was utilized to obtain a measure of the physical fitness of all subjects. A statistical test was made to evaluate the difference obtained between the mean Physical Fitness Index of the two groups. The result of this test indicated that the difference between the two groups in physical fitness was not statistically significant. It was concluded that schizophrenic patients do not decline in physical fitness as a result of hospitalization but a low state of physical fitness is one of the concomitants of severe mental illness. The findings of this study were discussed relative to other studies in this area.

This paper presents one of a series of systematic investigations currently in progress that are directed toward a fuller exploration of the relationship between various facets of mental illness and physical condition.

The authors wish to express their appreciation to William H. Barnard for his cooperation in administering the PF battery.

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# A PSYCHIATRIC WARD GOVERNMENT PROGRAM

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## *Introduction*

Within the past ten years, we have heard much about patient or ward government in a number of Veterans Administration psychiatric hospitals and in some private institutions. As early as 1947, we read of such a program being initiated at the Boston Psychopathic Hospital (1). There is evidence or mention of self government in the same year at Winter Veterans Hospital at Topeka, Kansas (2).

Some programs have been in existence that long while others are just beginning. The idea of patient government, however, is not completely new, and at the present time many hospitals are using it as an adjunctive therapy.

Apparently the trend of this therapy is moving toward modifying the old, authoritarian hospital pattern, where everything was done for the patient, to a more democratic and realistic way of life, with patients governing their own activities and being allowed to share and make decisions for themselves.

Such a program had its inception on the psychiatric service at Crile Veterans Administration Hospital early in 1957. For approximately four years the patient government program, as it is called here, has been an integral part of the rehabilitation program for neuropsychiatric patients at this hospital.

This paper is prepared as an attempt at describing some of the features of this program.

## *Structure*

Regular group meetings are held twice weekly in the dayroom. The corrective therapist presides, and the patients carry on the meetings according to rules of parliamentary procedure. A ward secretary records the minutes of the meeting. Three to five other patients are elected or appointed to serve as committee representatives. They become spokesmen for the ward when certain issues arise which require approval or disapproval by the ward psychiatrist. All officers are elected by the group members. Additional committees are formed as the need arises.

Like all other patient activities on the psychiatric service, all who are able are invited to join the informal group meetings. Usually between 10-15 are present. Those who are too disturbed or on special observation are not permitted to attend.

New patients are introduced at each meeting

followed by a brief orientation as to purpose of the meetings. This is usually handled by the secretary. However, if at that time it is not feasible for the secretary or another patient to perform this function, then the group leader will assist in the matter. It also helps to set the new patient at ease and makes him feel comfortable.

Following the reading of the minutes of the previous meeting by the secretary, discussion takes place on current business. Special reports from the committee members are a highlight of the meetings because they usually have the answer to most of the issues.

The meetings are scheduled for one hour's duration. This does not mean that the meeting must continue for a full hour. If there are no further issues to be discussed or the meeting is lagging, the meeting is promptly adjourned, as long silent periods are not considered helpful or therapeutic.

The only people present in our meetings are the patients, the therapist, and occasionally the ward nurse is invited if she should have a topic to discuss which concerns the group as a whole. Otherwise, the meetings are limited to individuals who are able to mingle in a group atmosphere.

As a patient progresses from individual corrective therapy on the closed ward to group activity on the semi-open ward, he becomes a member of the ward government group automatically.

Individual corrective therapy, as it is carried out at this hospital, means creating an interpersonal relationship with the patient which will lead to interaction with other patients and eventual resocialization of the patient.

The job of the therapist is to "reach" the patient. Since group experiences are not possible for this patient, the therapist establishes a one-one relationship with the patient in an attempt to attract him toward participation in some kind of activity in the corrective therapy gym.

Initial contacts are made with the patient on the ward. This period may be referred to as a "warm-up" period in which the therapist seeks to find some latent interest or offers an opportunity for the patient to become acquainted with the therapist. The patient is not coerced into accompanying the therapist but rather is permitted time, maybe two-three days, to make his decision. In extreme cases, the psychiatrist is consulted to determine the best course of action.

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When the patient is taken off the ward, activity is of secondary importance and is used chiefly as a media to acquire our goal. The most important factor is our personal effect on him, and the relationship being built through daily contacts is of major therapeutic value.

When the ward psychiatrist feels that the patient is ready for a more complex ward life he is moved along where he joins the ward government group. Here he is eligible to participate in the therapeutic setting, thus given the opportunity, along with the other members, to express his feelings and ideas.

#### *Role of the Psychiatrist*

The ward psychiatrist shares an active interest in the overall planning and development of the patient government program. In his official capacity as both therapeutic and administrative head, he shoulders the responsibility of delegating the authority to the ward committee members in dealing with matters of ward policy. Since the committee is representing the entire ward, problems and issues are discussed privately.

Serious consideration is given each request. The doctor may indicate what action is to be made for the satisfaction of the patients, and if no action is possible, then this is explained fully. This helps to reduce ill feeling toward administrative policy, which may at times be interpreted as being arbitrary and impersonal (3).

If permission is granted by the doctor for certain privileges, the group is responsible for working out details such as posting a notice on the bulletin board, suggesting proper conduct, and emphasizing the social responsibility involved to the group. In this way patients are stimulated to do more for themselves and to feel a sense of accomplishment.

Some other examples of granted requests are as follows:

1. Acting as host on visiting days. This involves issuing clearance cards, receiving and guiding new visitors, and keeping a prepared roster of visitors' names.
2. Taking charge of patients' baggage room; assuming responsibility of key to the baggage room and informing the patients that anyone desiring cigarettes, candy, or supplies, that the room is open.
3. Making phone calls requesting permission to tour various industries, museums, airport, etc., in Metropolitan Cleveland as part of scheduled weekly field trips.
4. Responsibility for composing letters of gratitude

to hosts following off-station trips, which are usually scheduled once a week.

5. Handling coffee-runs to the canteen for the patients. Two patients are selected to assume the responsibility of securing orders for the coffee and delivering it from the canteen to the patients.

#### *Role of the Group Leader*

The group leader works in close contact with the patients on the admission ward. Individual daily contacts are utilized in building a friendly, personal relationship with the acutely ill psychotic.

In the therapist-patient relationship, the patient is accepted as he is, although his behavior at the time may be unpredictable and unacceptable the patient is permitted to participate in his choice of activity within the limits of practicability and safety.

When the patient joins the group for meetings he is invited to sit down in a group circle. The withdrawn, shy patient needs constant urging sometimes just to join the group. The therapist is considerate and does not "push". The patient is allowed time to make up his mind. Patients who sit in the background are drawn in gradually by the therapist, asked for their ideas or opinions on a topic. If the patient is not alert, or is preoccupied, the question is re-phrased by the therapist, so that the patient has a chance to answer. At all times, patients are recognized and given the opportunity to voice their opinion. Every once in a while a patient will go off on a tangent or "kaleidoscopic idea" of his own, which may be irrelevant to the meeting, but he is not condemned for it.

#### *Examples of Group Action*

1. Setting up detail jobs on the ward—care of the furniture, washing windows, emptying ashtrays, etc.
2. Deciding on extra time regarding television, especially when special events take place.
3. Making rules governing patients—for instance—ping-pong playing is forbidden in the dayroom when the television is playing. This was a serious ward problem in the initial phases of the ward government program. It was brought up in one of the meetings and solved by the group. Rules pertaining to ward life are now posted on the bulletin board and subsequent groups are governed by these rules.
4. Planning Library visits—one hour a week is offered so that patients may take out books of their choice and spend a little time reading and chatting in a social setting.
5. Planning a Variety show—consisting of a one-act skit, violin and piano playing, recitation of "Casey at the Bat," and group singing. This was staged as an evening's entertainment for the entire psychiatric service by the group itself.
6. Supervising Canteen privileges—patients are issued canteen books and required to purchase their weekly supplies. One patient is assigned to collect canteen books from the nurse, distribute them to the patients, take their orders for the canteen, collect for their orders and then return the books to the nurse.



7. Setting up and supervising weekly telephone calls.
8. Providing additional visiting hours—some patients complained of not being able to see relatives on Wednesday afternoon, a regular visiting day, because of various reasons; work, long distances to travel, etc.: This left them only two hours to visit on Sunday afternoon. Now patients are enjoying an extra evening to visit with their relatives and friends.
9. Setting up voluntary work details—taking care of the grounds and working in the laundry. Plans are now being made to allow interested patients to work in other departments in the hospital.

Sometimes during the course of a meeting, group interaction gets bogged down. This is the time for the therapist to take a more active part. It may mean reviewing for the group progress on certain topics, which have been forgotten. It may mean summarizing important points for the group, especially during a meeting where many ideas are brought up. When the meeting may become too threatening for a patient, due to certain individual behavior problems, the group leader is then forced to intervene and exert controls. The leader's usual permissiveness is not allowed to be weakness. The quality of firmness is as essential as permissiveness in the leader's attitude.

Group discussions are concerned with the problems of the group, as a whole, and so, personal problems are avoided and frowned upon by members of the group.

Group meetings are written up by the therapist and discussed in a weekly seminar which includes the chief psychiatrist, psychologist, nurses, social worker, and other ancillary group leaders.

### *Excerpts From Meetings*

Cited below are examples of group action which brought out complaints and provided a method for patients to handle them.

1. Some of the patients had been complaining about the evening activities during the summer months. Since this involved the Recreation Department, the chief of recreation was invited to answer some of their questions. Chief complaints centered around the selection of music, lack of girls at the dances, and the type of dancing. The patients were strongly against square dancing. Their complaints were aired and when reasons were pointed out and explanations given by the recreation chief in regards to pertinent questions, they were able to accept this as a satisfactory answer. Later on when special questions arose about other departments in the hospital, supervisors from the contact office, protective service, and dietetics service were called upon to offer their explanations.
2. One patient had a habit of putting his cigarette out on the dayroom furniture. He defended himself, one day in a meeting, by blasting out and saying, "It's not all my doing." The group agreed, but it was repeated to the patient that nice furniture deserved the best of care, and that it was the patient's responsibility to cooperate in the matter.
3. Patient X was a tall, hulking man who repeatedly planked himself in a seat directly in front of the screen when watching television. This provocative behavior upset many patients, who were individually afraid to do

anything about it, because of the offender's size. However, group action did solve the problem. In the next group meeting, the subject was brought up by one of the patients in an attempt at alleviating this problem. Various suggestions were made. One patient said the tall men should sit in the back row with the smaller men in front. Another mentioned raising the television set off the floor. Finally the furniture was arranged near the television so that everyone could see. In a controlled setting such as this, where parliamentary procedure prevails, patients are able to exert controls toward one another through group pressure for more normal and considerate behavior.

*Sample Minutes of a Ward Meeting* Meeting # 260  
 Patients Present: AB, JC, GC, RD, JF, AJ, EK, EL, RR, WR, JS, JT, and MZ.  
 Patients Absent: RL  
 New Patients: GC

Meeting opened with the Secretary, JT, reading the minutes from last week's meeting, after which RR brought forth the possibility of planning a trip for the near future. WR expressed his desire to go to the country. There was a brief period of silence, which was interrupted by JT suggesting that we visit the Sealy Mattress Company. GC replied "That would be nice, since we are all sack rats, anyway." WR took offense at this, stating "Speak for yourself," and the trip issue was dropped temporarily. EL changed the subject by requesting that toothpicks be placed on the dining tables. MZ objected, stating "Either brush your teeth, or get dental floss." GC then spoke up, saying "I don't want someone punching me in the eye with one of those." JS intervened, stating, "I have said before, and I say again, we should have a time for prayer twice a week." MZ replied, "Keep religion out of this place. Religion is not what it's for." GC arose and walked over to MK, stating, "Brother, JS is right. I felt very blue the other evening, and JS laid his hand on my shoulder, and I've felt better ever since." WR cursed and stated, "All I want to do is get out of here." GC then walked over to WR with hands on hips, stating, "I'm telling you I was in the last two wars and know what it means." WR mumbled something about cracking up, then MZ asked GC to explain why JS should have religion on ward. GC replied, "I stick with JS." At this point GC started to rub his knuckles and his face flushed. The group leader intervened, and the subject was changed to securing a new member to serve at the Visitors' Desk on Wednesday afternoon for one and a half hours. JF volunteered. JT stated, "I'll orient him, since I have served in this capacity during the past." WR rose from his chair, walked over to MZ, and mumbled something about "Whatever you put into something, that's what you come out." MZ rolled his eyes toward ceiling with an expression of half perplexity and half grin. WR then returned to his seat.

The group leader then suggested that we plan a softball game for next week, with Ward 33, from 10 to 11 A.M. The group responded favorably, and plans got under way.

At this point the ward nurse entered the meeting and later announced that a Volunteer lady would deliver one hundred roses to be planted in the area. No one objected to helping with this project.

Meeting adjourned at 2:00 P.M.

### *Conclusion*

The aims of patient government may be summarized as follows:

1. To improve the hospital environment and to improve inter-personal relationships between patient-patient, and personnel-patient.
2. To foster self-development.
3. To provide those group experiences which will

Cont'd on P. 154

# ACCREDITATION OF INSTITUTIONS PREPARING CORRECTIVE THERAPISTS

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The accreditation program of the Association For Physical and Mental Rehabilitation, Inc. seeks to improve the quality and uniformity of preparation of candidates for the profession in educational and clinical institutions throughout the nation. Participation is on the basis of voluntary and cooperative effort with requests for evaluation being instituted by these affiliations.

Requisite to such appraisal is the determination of necessary criteria for judging areas of concern which are considered pertinent to adequacy and the ascertaining of qualifications or competence of institutions. Development of standards for evaluation which are acceptable to all concerned requires considerable study and must evolve as critical instruments for measuring values are discovered.

The application and translating of such standards are initially the responsibility of institutions seeking approval. When all items and factors prescribed have been checked to their own satisfaction credentials are then submitted to the Education Committee of the Association. Analysis is then made as to the effective compliance to requirements and the application of the recommendations in actual practice.

Since evaluation is a continuous process such approval is granted for only a five year period with reappraisal conducted at the conclusion of this term of service to assure maintenance of high standards.

The Association neither desires nor has the authority to compel institutions to accept a defined curricula which must be followed. It is however within the Association's purview, and in the best interest of schools to make recommendations which are uniform. The requisites for competence have been established after extensive investigation with the conclusions being based upon a broad consensus of qualified authorities.

Compliance with standards of preparation is essential to the growth of a profession and particularly necessary for medical and educational acceptance. Recognition of schools complying with these established standards is possible through accreditation of these institutions. Such a procedure is in keeping with general practice in a majority of the professional fields.

Completion of the didactic and clinical training of candidates is followed by a comprehensive examination. Upon the successful fulfillment of the requirements a certificate is awarded designating the candidate as a certified corrective therapist.

Evaluative procedures are at present in the formative stage yet definite areas have been defined as elements which must be considered in the forming of judgment as to appraisal. Factors of major meaning to be studied in the process of approving institutions are presented:

1. The institution is accepted by the National Council For Accreditation of Teacher Education, the American Association of Colleges for Teacher Education, and the State Education Association of the respective area for the accreditation of Secondary and Schools of Higher Education.
2. The major program in physical education is listed and approved by the American Association of Health, Physical Education and Recreation. Such approval is based on the annual list of the National Council for Accreditation of Teacher Education and is published in the *Journal of Health, Physical Education and Recreation* each year. This organization is a department of the National Education Association.
3. The accompanying letter requests consideration for approval and describes the institution enrollment, departmental philosophy, number of men and women majors, units required for the major and graduation, clinical affiliation and provision for supervision by a coordinator from the department, facilities which are available, and other information which may be helpful in forming a judgment.
4. The professional faculty complies with acceptable standards of the American Association of University Professors. The institution has a staff adequate in number and breadth of experience to conduct the program adequately. The staff holds sufficient advanced degrees which qualify it to offer graduate work in these specialties and presents biographical vitae of all staff members participating in the program for review.
5. The undergraduate and graduate curricula for didactic and clinical experiences follow closely the recommended professional standards of the

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Association listing hours, credit values, course descriptions and outlines, as well as texts and references being used.

6. The affiliation between the educational and clinical facilities is established in accordance with the suggestions offered in *Directional Goals for Clinical Therapy Experiences*, the type of educational and medical supervision described in detail, and a clarification of the varied range of experiences offered to assure adequate breadth.
7. The administrative format prescribed by the Association as to the granting of credits, grades and basis, number of units or hours to be taken, conferring of degrees, accepting students only from institutions on the approved list as described for clinical training, school's responsibility for complete supervision and coordination and other administrative procedures is present to assure compliance with the educational standards.
8. The facilities, experiences and programs of the affiliations are critically reviewed to make certain that comparable background is available to all candidates wherever the program of study is taken. Uniformity of preparation throughout the nation is most essential in order that graduates from any section of the country may be qualified to accept positions in other areas and be competent to carry on the services inherent in the profession.

Framed certificates for display by accredited institutions are prepared by the Education Committee and forwarded to the local chapter for presentation in behalf of the Association at a suitable ceremony. Approval of this nature is important to schools seeking to recruit students anxious to obtain training of high calibre, nationally recognized.

Administration of this program, while delegated to the Education Committee as a whole, is the direct responsibility of a designated individual who serves in dual capacity on the Certification Committee. It is his assignment to administer the program in accordance with the directives established seeking to maintain close liaison between the two related functions.

Establishing of this important measure for the further advancement and recognition of the profession is of major significance. Creation of this plan for approving institutions completes the functions pertaining to professional preparation, namely: development of definite curricula, creating accreditation procedures, and registration of certified corrective therapists. Such action is comparable to practice

of the American Medical Association in its approval of medical schools by the parent organization as well as in a majority of other professions.

The influence of the entire membership in its attitude to the acceptance of high standards, and its seeking to encourage schools to accept such proposals in their affiliations will do much to raise the quality of available therapists. Professional growth will likewise be enhanced through these measures and reflect the merits of such universal procedures.

Special tribute is to be paid to Eastern Washington College of Education, Cheney, Washington and to Jack R. Leighton, Ph.D., Chairman, Division of Health, Physical Education and Recreation, for its selection as the first institution to be approved for accreditation by the Association. The fine presentation of materials and excellent offerings which have been developed may well serve as a pattern for others to follow. We are all proud of the efforts of this institution and its acceptance of our evaluation in the achieving of greater recognition for the profession. Through its example other schools will undoubtedly follow in seeking approval.

Information as to the method for making application for accreditation may be obtained by contacting the Chairman, Education Committee, Association for Physical and Mental Rehabilitation.

### "From Other Journals"

Unless noted otherwise, all abstracts have been prepared by Philip J. Rasch, Ph.D.

Eleanor Metheny and Lois Ellfeldt, *An Inquiry into the Nature of Movement as a Significant Form of Human Experience*. Unpublished paper presented at the World Seminar on Health and Fitness, Rome, Italy, August 28, 1960.

A *kinestruct* is a dynamic form constructed by body masses in motion. A *kinecept* is the perceptual form resulting from integration of the kinesthetic perceptions associated with a *kinestruct*. A *kinesymbol* is a conceptual form that represents the meaning a person finds in the *kinecept* of a *kinestruct*. A *kinesymbol* cannot be conveyed in words, but evidence that it is meaningful can be given by the way a person acts. Such symbols are used by the mind just as are any other symbols, and make their own unique contribution to man's comprehension of reality. Habitual postural *kinestructs*, for example, have long been recognized as *kinesymbolic* expressions of personality. Structured movement experiences are a source of mental-emotional concepts. As such they can be identified as a learning experience and justified as subject matter in the curriculum.



Eugene V. Doroschuk and T. K. Cureton, Diet in Athletic Conditioning and Training. (Urbana: University of Illinois, n.d. Mimeographed. 4 pp.)

The question of what constitutes a nutritionally adequate diet for athletes has not been answered. There is no doubt but that hard work demands increased caloric intake and a proportional increase in vitamins. In the absence of definitive dietary allowances it would seem best to provide a saturation of nutrients. Grafe and Yakovlev, of the U.S.S.R., have made one of the first attempts to provide an optimal diet for athletes. Their goal is to prevent deficiencies, which are often subclinical in nature, provide additional energy, and expedite the recovery process. Too little attention has been paid to the vitamin intake of athletes and too much emphasis has been placed on the consumption of calories and proteins.

K. K. Gupta, V. N. Rao, and Bal Krishan, Value of Recovery Pulse as an Index of Physical Fitness. *Indian Journal of Medical Research*, 48:613-617, September, 1960.

Taylor concluded that recovery pulse does not offer promise for a reliable measure of fitness, but his recommendation that one should look for responses during exercise is practicable only in a well-equipped laboratory. The object of this study was to see how well recovery pulse after severe exercise of two minutes is correlated with other criteria of human fitness. Eight subjects were given severe exercise for two minutes. Recovery pulse at 30 sec. correlated 0.690 with oxygen consumption kg./min.; 0.569 with ventilation ratio; 0.882 with ventilation equivalent, and 0.826 with metabolic ratio. It is concluded that recovery pulse offers a valid measurement of physical fitness.

William G. Ellis et al., The Trampoline and Serious Neurological Injuries. *Journal of the American Medical Association*, 174:1673-1676, November 26, 1960.

The rise in inexperienced performers on the trampoline has been accompanied by a rise in the number of injuries sustained during its use. In this paper the cases of five patients who suffered extensive neurological damage are presented. All but one involved imperfectly executed backward somersaults. Three of the patients developed quadriplegia following acute flexion of the neck. A ten point code for regulating the use of the trampoline is suggested.

E. K. Zhukov and Iu. Z. Zakhar'ants, Electrophysiological Data on Some Mechanisms for the Overcoming of Fatigue. *Sechenov Physiological Journal of the U.S.S.R.*, 46:955-963, 1960.

Little is known about the physiological mechanisms by which an individual can continue work for a time after the development of fatigue. EMG studies showed that during fatigue the amplitude of the electrical potentials of the muscle was increased, the frequency reduced, the summated electrical activity increased, the muscle fibers were excited synchronously, and excitation spread to other muscle groups, including the antagonists. All of these are signs of incoordination. It was also noted that respiration became irregular. However, by making a great effort, the individual could continue the work.

It follows that the definition of fatigue as a reduction in working capacity as a result of work is inaccurate. The main index of fatigue is a disturbance of the coordination of the functions. In certain forms of work, fatigue may depend primarily on changes in the muscle itself, but the most likely reason for the observed increase of summated electrical activity is the involvement of fresh neuromotor units. This is a physiological mechanism for overcoming fatigue.

The development of fatigue shows two phases. In the first, signs of fatigue are present, but as a result of voluntary effort work can be continued. In the second phase work becomes impossible and complete exhaustion is present. The distinguishing of these two phases is essential in connection with the analysis of the development of fatigue and the evaluation of the degree of fatigue. (Translated by R. Crawford.)

N. N. Iakovlev, et al., Age Features in the Reaction of the Organism to the Performance of Physical Exercises. *Sechenov Physiological Journal of the U.S.S.R.*, 60:970-978, 1960.

Age features in the reactions of adolescents, adults, middle aged and elderly people to a standardized physical task and to athletic exercises were investigated. The intensified cardiac activity in adolescents, middle aged and the elderly depended more on increase of rate than on increase in the strength of the cardiac contractions. There was a greater increase in the lactic acid in the blood of adolescents and the elderly, indicating that glycolytic processes are of greater importance in the provision of energy for work than in the middle aged. The oxygen consumption per unit of time per kg. of bodyweight diminishes with age, and the regulation of functions and ratio of anaerobic to aerobic oxidative processes is less perfect in adolescents. There was a smaller increase of the blood sugar level in adolescents and individuals over 40, indicating a poorer mobilization of intrinsic energy reserves. Changes in blood cholesterol did not indicate any definite age differences.

In all groups non-competitive rowing and swimming produced favorable physiological reactions. Ski runs and cross country runs produced favorable reactions in adolescents and young and middle aged individuals, but unfavorable ones in the oldest group. Gymnastic lessons fell midway between the two. All physical exercises examined were considered suitable for those up to the age of 50; those older than this should practice cross country or ski running only with great caution.

Physical training for 4-6 months resulted in improvement in all age groups, but the degree diminished as the age increased. Acclimatization to altitude also diminishes with age. (Translated by R. Crawford.)

Flemming Bonde Petersen, et al., The Effect of Varying the Number of Muscle Contractions on Dynamic Muscle Training. *Internationale Zeitschrift für Angewandte Physiologie einschliesslich Arbeitsphysiologie*, 18:468-473, 1961.

Student nurses were divided into four groups of approximately equal isometric strength of the elbow flexors. Groups I, II, and III trained the left elbow flexors for 30 days with 150, 100, and 50 contractions per day. Group IV served as controls. Endurance was tested by ergometry. After training, dynamic strength showed an increase of 29, 34, and 27% respectively. Significance levels were .01, .05, and 0.10 respectively. No change was observed in the control group. No increase in isometric strength resulted. This was attributed to the relatively small number of contractions used. It is possible that dynamic strength is influenced by different factors than influence isometric strength. There was a tremendous effect on muscular endurance. It has been shown by Mosso and by Samson that there is an exponential relationship between work load and work accomplished in an endurance test, with the amount of work decreasing as the load is increased. This may explain the modest increase in strength as opposed to the tremendous increase in endurance.

J. Joseph and I. McColl, Electromyography of Muscles of Posture: Posterior Vertebral Muscles in Males. *Journal of Physiology*, 157:33-37, June, 1961.

The activity of the posterior vertebral muscles between the upper part of the sacrum and the spine of the fourth cervical vertebra was investigated at 12 levels in 20 males standing at ease. There is little or no activity in the lumbar and cervical regions and moderate or marked activity in the lower thoracic. The line of weight of the body above the lumbar region passes behind the transverse axis of the joints between these vertebrae, so that the trunk is extending in the lumbar region under the influence of gravity and the extensors (posterior vertebral muscles) are inactive. In the lower thoracic region the line of weight passes in front of the transverse axis of the vertebral joints and the posterior vertebral muscles contract and resist flexion of the trunk. In the cervical region slight activity is required to supplement the passive structures which resist flexion of the neck.



H. M. Hodkinson, Judo. *Medical World*, 93:331-334, October, 1960.

Doctors may be asked to advise about the suitability of judo as a sport, but most of them know nothing about it. It can be readily adapted to the individual. Most boys take to it enthusiastically. Several blind people have become reasonably proficient, as knowledge of an opponent's moves comes partly through proprioceptive channels. Deafness is not a handicap. Men with wasted limbs due to poliomyelitis, with talipes, and even a below-knee amputation have been able to practice judo with enjoyment. Injuries are minimized by special training in how to fall, by control of the fall, and by resilient mats. Nevertheless, some shoulder and clavicle trauma does occur and concussion sometimes results, though these are rarely severe. Cartilage injuries are more common, but judo does not cause more injuries than rugby or soccer. Improved fitness, strength and muscular development (particularly of the thighs, neck, and shoulders), self-confidence, self-control, posture, and co-ordinated use of the whole body result from its practice.

R. S. Person, Electrophysiological Study of the Activity of the Motor Apparatus of Man in Fatigue. *Sechenov Physiological Journal of the U.S.S.R.*, 46:945-954, 1960.

The amplitude of the electrical activity of a muscle is directly proportional to the force developed by the muscle. In fatigue the frequency of the electrical activity is reduced, and the amplitude is increased. There is a transition from asynchronous activity of the motoneurons to synchronous activity. Most authors agree that this reflects changes in central impulsion from the motoneurons and not peripheral processes in the muscle, but interpretation of these phenomena is very complicated.

In fatigue there may be a true increase in the electrical activity of a muscle as the result of excitation of a large number of motor units. There may be irradiation to the antagonist muscle, in consequence of which the agonist must not only support the load, but overcome the tension of the antagonist. In the experiments described, irradiation of the antagonist was either weak or non-existent. The force of muscle contraction might be increased by tremor. In tremor static work is replaced by dynamic, and dynamic work develops greater electrical activity than does static work. In weight supporting experiments a relationship between the prominence of tremor and the increase in electrical activity of the muscle was demonstrated. It is possible that as the tension in each motor unit is reduced as a result of fatigue, larger numbers of motor units become active. The occurrence of synchronous excitation indicates an exceptional form of functioning and is evidence of disturbance of normal conditions. The determination of the site of these processes, the order of their development, and their respective responsibilities are problems of prime importance. (Translated by R. Crawford.)

Jorgen W. Hansen, The Training Effect of Repeated Isometric Muscle Contractions. *Internationale Zeitschrift für Angewandte Physiologie einschliesslich Arbeitsphysiologie*, 18:474-477, 1961.

Studies of training procedures have raised the question of whether the resulting increase in working capacity is due to increased vascularisation in the muscles, increased contractile substance, or a change in function of the CNS ("motor learning").

Ten females performed 150 isometric contractions per day for 30 days. The ability to perform repeated contractions increased 1058% ( $P=0.001$ ); the ability to perform repeated dynamic contractions increased only 41% ( $P=0.01$ ). Isotonic strength was unchanged. Differences in ability to perform isometric and dynamic contractions must be attributed mainly to changed function of the CNS. This agrees with Hellebrandt's statement that "a significant proportion of the end result of systematic voluntary exercise is due to motor learning," and is important in remedial exercises and the training of athletes. Hettinger and Mueller espouse the point of view that very few isometric contractions give an excellent training response. Rasch and Morehouse, Bonde Petersen *et al.*, and the author of this paper represent the opposite point of view.

B. Kwiet, Medical Observations in Six-Day Bicycle Riders with Typical EKG Changes. *Deutsche Medizinische Wochenschrift*, 79:1789, November 26, 1954.

Six day bicycle races last for 145 hours. Two riders form a team, one of whom must always be on the runway. The fourth and fifth nights represent the critical time when lack of sleep, nervous strain, and the unfavorable environment exhaust the performer. The mucous membranes of the respiratory passages become irritated, the gluteal region and scrotum often become painful, the stomach becomes upset, constipating and vomiting may occur, and depression or complete exhaustion may set in.

Most performers have a high sugar intake. Most of them take large amounts of orange and grapefruit juice; many drink ovaltine or tea. Most riders do not smoke; alcohol is used only occasionally and sparingly. The managers may use "secret" drugs, in which the riders display great faith. Sexual habits vary widely.

The heart of the rider is often hypertrophied and hypotensured. After a race the EKG shows deformity of the ST and T waves. These last for a relatively short period, indicating they are functional. They represent changes in the acid-base balance of the cells as a result of the overloading of the blood with metabolic and fatigue products. Nervous factors may also play a role. (Abstract of a translation.)

H. C. K. Velhagen, Swimming-pool Conjunctivitis. *Deutsche Medizinische Wochenschrift*, 16:1195, June, 1961.

Conjunctivitis, after the use of chlorinated swimming pools, particularly indoor swimming pools, is without doubt caused by the chlorinated water. However, the slight irritation is of rather short duration and harmless. For very sensitive persons it may be prevented by application of 2% boric acid ointment or Ol. Oliv. purissimum before and after swimming. We must not forego the chlorination of the water, because of the danger of real serious infections and difficulties. Previous to the chlorination of the swimming pools, conjunctivitis epidemics (paratrachom) were observed quite frequently. (Translated and abstracted by Robert Kramer.)

B. K. Anand, G. S. Chhina, and Balder Singh, Studies on Shri Ramanand Yogi During His Stay in an Air-Tight Box. *Indian Journal of Medical Research*, 49:82-89, January, 1961.

It is claimed by some Yogis that they can bury themselves underground and stay there for a number of days. This is possible only if they can decrease their basal metabolism and hence oxygen utilization. The metabolic pattern of Shri Ramanand Yogi was studied, after placing him in an air-tight sealed box, to establish any variation from normal basal levels. The results indicate he was able to reduce his oxygen consumption considerably below his basal requirements. Neither hyperpnoea nor tachycardia developed. The EKG did not show any abnormality. The EEG showed a pattern typical of the initial stages of sleep. Body temperature rose to 101.5° F.

B. K. Anand and G. S. Chhina, Investigations on Yogis Claiming to Stop Their Heart Beat. *Indian Journal of Medical Research*, 49:90-94, January, 1961.

Three Yogis who claimed to stop the beating of their hearts voluntarily were studied. Each employed the Valsalva maneuver. The heart sounds could not be heard and blood pressure could not be recorded during these maneuvers, but the EKG tracings were regularly recorded. X-ray studies showed the heart continued to beat regularly. The alpha rhythm disappeared from the EEG tracings. It was concluded that the subjects had no voluntary control over their heart's activities.

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## Book Reviews

**Psychology of Personal Adjustment**, by Fred McKinney. (New York: John Wiley and Sons, Inc., 1960. 490 pp. \$6.50.)

This is a text written for, and dedicated to, college students. It is stated that the text is student-centered and the author discusses with tact and understanding such sensitive problems as the question of petting, the control of masturbation, and factors in marital adjustment. The emphasis throughout appears to be on adjustment, or as the author prefers, "adjustiveness." This consists not only of conforming to environment but often of changing it. The text should be read by the senior high school or freshman college student to be most effective. Unfortunately, such texts are not usually encountered until one is nearing graduation from college, and by that time many of the problems discussed have been resolved, well or otherwise.

A distraction to easy reading of McKinney's book are the cryptic numbers located throughout the text. The author explains that these have reference to a separate bibliography included in an Instructor's Manual. It is difficult to conceive of a student-centered class which requires a manual for the instructor. Besides, it is reasonable to assume that the average college student needs the use of the bibliography more than does the instructor.

The numerous case studies cited will be found to be of value for those working in the field of rehabilitation, and the text should be of considerable worth as a source book for guidance personnel.

WRP

**Report of a Joint Committee on Mouth Protectors**. (Washington, D.C.: A.A.H.P.E.R., 1960. 21 pp. Paper. 50c.)

A joint committee from the A.A.H.P.E.R. and the A.D.A. herein report the results of their study of the use of mouth protectors in football. In a word, they conclude that nearly all injuries to the teeth and mouth can be prevented by proper protectors. This paper examines the characteristics of the various types, describes how they may be made, and provides a documented survey of the existing situation. The booklet is required reading for athletic directors, school dentists, and others associated with athletics.

PJR

**Orthopaedics for Nurses**, edited by M. C. Wilkinson and G. R. Flak. (London: Faber & Faber, 1961. 363 pp. \$5.30.)

This is an attempt to present both modern orthopedic thought and practice and older methods, tried and proven, which are in danger of being lost. It was written by outstanding British contributors, but is not provincial in scope and will be as useful in Asia and Africa as in the United Kingdom. The book is very practical, as properly it should be for nurses or physiotherapists, with many pictures and sketches demonstrating the use of splints, modalities and the reasons for their use. Traditional subjects such as skeletal tuberculosis, cerebral palsy, osteomyelitis, and arthritis are well presented, as well as techniques which are applicable in the many and varied aspects of nursing orthopedics. This is an excellent reference handbook for nurses and physiotherapists.

MLB

**Speech and Hearing Problems**, by Charles E. Palmer. (Springfield, Illinois: Charles C. Thomas, 1961. 137 pp. \$5.50.)

This simply written booklet is a useful guide for parents, teachers and physicians who need a practical "know-how" approach to speech and hearing problems. It covers the areas of articulation, stuttering, voice, hard of hearing and the deaf. This booklet is a helpful substitute for professional assistance when that cannot be obtained.

NWF

**Progressive Weight Training**, by Jack R. Leighton. (New York: The Ronald Press Company, 1961. 143 pp. \$4.00.)

*Progressive Weight Training* is designed as a text for the high school or college student and is the most extensive coverage of the subject at this level that has come to this reviewer's attention. It comprises seven sections; Introduction, Facilities and Equipment, Exercise Programs, Conduct of the Exercise Programs, Evaluation of the Exercise Programs, Special Exercises and Specialization, and Weight Lifting. There is a lavish use of photographs. Most of those depicting exercises are double, showing both the starting and the finishing positions. Each exercise is described in some detail. The use of weight training by girls is strongly emphasized—a highly desirable development but one which will no doubt distress Oberteuffer.

Unfortunately there are a good many specific items to which a reviewer must take exception. The author's citations to the literature are undesirably restricted. For example, there is no reference to the writings of Klein or of Helfet in the discussion of the possible dangers of the squat, nor is there any mention of the Morgan and Adamson program, now so popular among athletic coaches and trainers. There is an unfortunate disposition to categorical statements which are not necessarily so. The idea that "It is highly important that each exercise be performed in exactly the manner described" went out when "cheating" exercises came in. It is not true that "To determine strength scores for any student, he must be classified according to the McCloy Classification Index." Studies of athletes, for instance, are much more frequently reported in terms of Cureton's TPS test. It would have been well to explain *why* a lifter holds his breath, and the reader should be warned that this practice may produce undesirable effects in untrained persons; that the primary reason for elevating the heels in squatting is to throw the weight forward and thus place more stress on the quadriceps, etc. etc. A muscle chart is a definite need and would have obviated the necessity for such clumsy expressions as "Quadriceps femoris (rectus femoris, vastus lateralis, vastus intermedius, vastus medialis) of the front of the thigh or upper leg . . ."

The straight bar shown on the lat machine is an inefficient design and has been discarded in modern gymnasia. There is no reference to the use of the hopper in dead lifting, although this saves many a sore back. The subjects doing supine presses on the bench should be shown with their feet wide apart to obviate the danger of tipping. The method of leg pressing depicted is so dangerous that it should never be used. If a leg press machine (not pictured) is not available, at least the bar can be suspended from the overhead by chains. In the French press the elbows should be kept near or touching the ears for the best results. It is certainly desirable to keep the back flat during pull overs, but there is no need to assume the grotesque position shown in the text. Straight arm pull overs, as shown on p. 37, frequently result in soreness at the elbow joint. Bent arm pull overs on a bench are both safer and more effective.

The exercise program order shows the curls done first; most experienced weight trainers greatly prefer to do presses first, as curls "tie up" the arms and interfere with pressing. The author favors the double progressive system, which is certainly a good one, but he might profitably have devoted some space to the heavy and light system, the light and heavy system, the thousand exercise system, circuit training, and other methods which some consider superior for the experienced exerciser. Since body building is only a means to an end, not an end in itself, some space could well have been given to considerations of training schedules for various sports.

It is interesting to observe that the point scores for girls in general are highest at the 9th Grade level and tend to decrease thereafter. This is in accordance with studies previously reported by Jokl and Cluver and others, although they noted that with increased body weight girls might show increased strength. Leighton would appear to be in an excellent position to determine whether weight training affects the present curves.

With more attention to details, a revised edition could become a standard work in its field.

PJR

**Elementary Human Physiology**, by Terence A. Rogers. (New York: John Wiley & Sons, Inc., 1961. 417 pp. \$6.50.)

The basic plan of this book is interesting—to center the discussion around the concept of homeostasis. Unfortunately the author has attempted to write for both the undergraduate who will never make any further study of biology and the one anticipating a career in the medical sciences. This goal is probably impossible to achieve and causes much of the author's material to fall between two stools. The former will have little interest in such recondite matters as the Krebs cycle and "Some Useful Physiological Solutions for Mammalian Tissues" and will be disappointed that smoking, air pollution, warm up, and other such factors of their daily lives are not discussed; the latter will be unhappy with the brevity of some of the material and that the bibliographies fail to direct him to the basic data. The discussion of isotonic and isometric muscle contraction is a good example of both faults.

Rather oddly, almost all of the references are taken from the *Scientific American* rather than from the original reports. For instance, p. 237 refers to formulae advanced by DuBois, by Krogh, and by Kleiber; p. 242 informs the reader that Gagge and his co-workers developed a measurement called a *clo* p. 259 quotes a statement by J. R. Brobeck, but none of these scientists' names appear in the references at the end of the chapter. Somewhat similarly, it is strange to see no reference to Masters' studies in the discussion of "The Sex Act in the Female." This lack of documentation becomes doubly annoying when controversial statements are involved. What is the evidence for the assertion that the DuBois formula is satisfactory for clinical use? Oliver *et al.* and others have subjected it to severe criticism. What is the evidence for the statement that, "On the whole, trained athletes tend to have larger than normal vital capacities?" Demonstrably, this is not true of marathon runners or of championship level wrestlers when compared with other individuals of equal body size. The definition of tone as "a constant, or tonic, state of contraction" (p. 331) certainly would not be acceptable to Basmajian and to Ralston and Libet or other electromyographers.

The presentation is generally more "modern" than is true of similar books which have crossed this reviewer's desk. Terms such as "feed-back mechanism," "push-pull," "make-break," "on-off," and other cybernetics expressions are common. There appears to be little question but that the student of physiology must resign himself to becoming familiar with a whole new terminology if he expects to stay abreast of developments in his field.

PJR

**Principles and Technics of Rehabilitation Nursing**, by F. J. Terry *et al.* Second edition. (St. Louis: C. V. Mosby Co., 1961. 344 pp. \$6.00.)

Insofar as there has been both insufficient utilization of the nurse in rehabilitation and lack of appreciation of her potential in this area, this book is a step in the right direction. Its aim is to provide special knowledge and technics for "members of the nursing service personnel functioning in the rehabilitation team."

The content is largely elementary and general, and the corrective therapist will probably find only tidbits rather than any substantial material to add to his fund of knowledge. A section on bed and bedside exercise routines, for example, for the arthritic or post internal fixation of the hip, spinal surgery, or meniscectomy would greatly aid this volume in fulfilling its avowed purpose. For the nurse who wishes a general introduction to rehabilitation nursing, this text will be satisfactory.

Despite a whole chapter devoted to the rehabilitation team, this reviewer noted no identification, indeed no mention of, the corrective therapist *per se*, although historical credit for much of the country's modern impetus toward the development of rehabilitation technics and concept is given to the efforts embodied in the military and VA rehabilitation programs, to which corrective therapists have made and are making important contributions.

DJS

**Proceedings of the National Conference on the Medical Aspects of Sports**, November 30, 1959, Franklin D. Yoder, Director. (Chicago: American Medical Association, 1960. 115 pp. Paper.)

As the title indicates, this booklet contains the talks given at a so-called "First National Conference on the Medical Aspects of Sports." This title seems to claim a good deal too much, in view of the fact that the American College of Sports Medicine has been holding similar meetings for several years and a large number of the speakers at this conference were drawn from active members of that organization. The quality of the presentations varies enormously, of course. Particularly outstanding is a paper by J. Kenneth Doherty, in which he examines certain data from the experiences of runners and draws therefrom some guiding principles and some inferences. The entire field of sports could use a great deal more of this sort of study. Rachun, Hale, and Snively *et al.* each presented studies on head protection and appear to be doing excellent work. Two long papers by Smith and Beecher deal with their study of amphetamine and secobarbital as related to athletic performance. Unfortunately for their conclusions, their methods of collecting and evaluating their data have been severely criticized by Pierson and only weakly and inadequately defended by the authors. *J.A.M.A.*, August 5, 1961.)

In view of the fact that the A.M.A. has never implemented the 1952 recommendation of the International Symposium of the Medicine and Physiology of Sports that sports medicine be made a recognized part of the medical curriculum, such conferences should meet a definite need on the part of physicians who are not members of the A.C.S.M. With such meetings and with the inauguration of *The Journal of Sport Medicine and Physical Fitness* under the auspices of the A.C.S.M. there can be no excuse for those concerned with the health of athletes even in remote communities, not being fully abreast of the times.

PJR

**Gerontology Program**, compiled by Ann M. Barron. (Los Angeles City Schools, 1960. 42 pp. Mimeographed, n.p.)  
**Handbook for Gerontology Teachers**, compiled by Ann M. Barron. (Los Angeles City Schools, 1961. 35 pp. Mimeographed, n.p.)

The first of these presents the gerontology program of the Adult Education Branch of the Los Angeles city schools. This program was designed for the needs of the specific area and may not be universally applicable. The geriatric exercises developed by Dr. Ainlay are illustrated and should be of interest to readers of this *Journal*.

The *Handbook* is a compilation of lesson plans used by instructors in adult education with their comments, plus a summary of answers given by adult education teachers to a survey regarding workshops and in-service training.

These two books will be of interest to those who wish to compare adult education programs devised by various communities.

WRP

**The Role of Speech in the Regulation of Normal and Abnormal Behavior**, by A. R. Luria. (New York: Pergamon Press, 1961. 100 pp. \$8.50.)

This small book on the role of speech and behavior contains the text of three lectures given at University College, London, in 1958 by Professor A. R. Luria, noted Russian psychologist. The style is scholarly and Pavlovian indebtedness is acknowledged for subject treatment. The latter is developed as follows: (1) the role of speech in the formation of mental processes, (2) the development of the regulatory role of speech, and (3) modifications of this role resulting from pathological states of the brain.

Speech is seen as the key factor (highly conditionable) in organizing our mental processes and eventually "perfecting the higher nervous activity of man." This book will be found helpful in orienting one's point of view toward research and the world of science.

NWF



**Administering City and County School Programs.** (Washington, D.C.: Am. Assoc for Health, Physical Education and Recreation, 1961. 128 pp. Paper. \$1.50.)

This is a report of a national conference of directors of health, physical education, and recreation, held in Washington, D.C. It records the conference addresses, discussion topics, supplementary papers, roster of participants, and conference resolutions.

WRP

**Skin and Scuba Diving, anonymous.** (Chicago: The Athletic Institute, n.d., 81 pp., \$50, paper.)

Water is not man's natural element, so before he dips beneath its surface, certain advice and precaution is necessary. This text comprehensively covers these precautions in addition to portraying the tricks of the trade. Half of the book is devoted to skin diving with Scuba and one-third to basic skin diving. For those unfamiliar with the format of the Athletic Institute booklets, each page usually contains four photographs or drawings accompanied by explanatory sentences. On page 12 the text is not in agreement with the photograph, and one photo has been used three times to illustrate three different points. Other than these relatively minor items, the book is well-edited and appropriate to the subject. *Skin and Scuba Diving* should be required reading for every swimming student and should be in the library of every advanced swimmer.

WRP

**Amsterdam International Congress—July 23-30, 1960.** (Washington, D.C.: Council on Health, Physical Education, and Recreation. 52 pp. Paper. \$1.00.)

This is a report of the Conference. It was resolved that every school should provide an adequate program of physical education and that there must be health education for all children.

WRP

# GOVERNMENT — Cont'd from P. 147

help the patient in making a better transition from hospital to community.

4. To help the patient feel that he can get along in the outside world again.
5. To inculcate in the patient's mind that with all privileges goes a corresponding responsibility.
6. To provide a more realistic opportunity for free expression, and in an atmosphere that is more spontaneous, informal and non-threatening to the patient.

## Acknowledgment

The authors wish to express their gratitude to Doctor Jack F. Ross, Chief, Psychiatry Division, for his able assistance and guidance in the preparation of this paper.

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## News and Comments

C. T. STAFF, TOGUS, ME.



Dr. Emma Earnerin, Chief, PM&RS (center), with Floyd Milbank and Charles Bader, Chief, C.T. In rear are Paul Mooney, Elizabeth Black and James Mahaney.

## VA PM&R EXHIBIT WINS AWARD

Veterans Administration scientific exhibits won three awards at the recent annual meeting of the American Medical Association in New York City. A certificate of merit went to Lyle H. Hamilton, Ph.D., Josef R. Smith, M.D., and Ross C. Kory, M.D., of the Wood, Wis., VA center, for the "unusual excellent nature" of their exhibit on use of gas chromatography in the evaluation of pulmonary function.

A certificate of merit went to A. B. C. Knudson M.D., and Frank J. Schaffer, M.D., director and assistant director of VA's physical medicine and rehabilitation service for their exhibit on rehabilitation of the long-term chronic patient.

Honorable mention went to Bror S. Troedsson, M.D., of the Minneapolis, Minn., VA hospital, for an exhibit on oscillometric arterial circulatory norms.

All three exhibits were designed and constructed by the visual aids division of the VA Central Office.

## CLINICAL TRAINEES AT CHILlicothe, OHIO



George Jurcisin, clinical training supervisor, Corrective Therapy, looks on as Paul Maple, Cleo McGuinea and John Goff, all of Ohio University, demonstrate an abdominal exercise technique.



# U. S. SPORTS MEDICINE LITERATURE - 1959-1960\*

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Eugene R. O'Connell, ACSM\*\*\*

In preparing the following bibliography the compilers have necessarily been limited to publications available in college libraries to which they had access. They are aware of the fact that there are state and other local journals which they were unable to survey; editors of and contributors to such publications are invited to assist in the preparation of future bibliographies by forwarding copies of their periodicals and/or articles for this purpose. No attempt has been made to include Master's theses and Doctor's dissertations in this bibliography; these materials may be located by the use of *Completed Research in Health, Physical Education, Recreation; Health and Physical Education Microcard Bulletin; Dissertation Abstracts*; and similar guides.

Critical comment by users of this bibliography is solicited.

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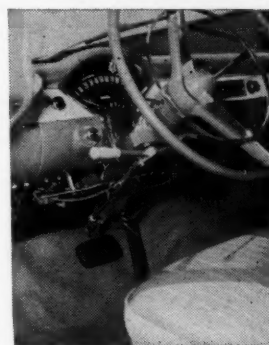
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